

December 1936

TECHNOLOGY

REVIEW

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And I wish you
many of them...

They Satisfy



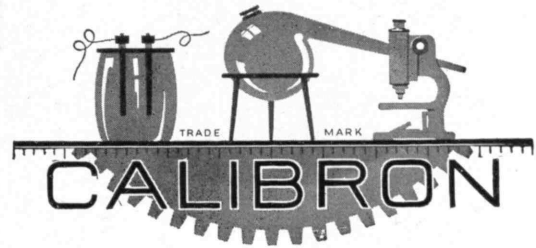
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THE TABULAR VIEW

AERONAUTICAL design has become one of the most refined and exacting of the engineering sciences. As Lewis Mumford phrased it in "Technics and Civilization," "the gross oversizing of . . . dimensions, with an excessive factor of safety based upon a judicious allowance for ignorance, is intolerable in the finer design of airplanes; and the calculations of the airplane engineer must in the end react back upon the design of bridges, cranes, steel buildings: in fact, such a reaction is already in evidence." Clark B. Millikan, in his address before the industrial physicists (see page 61) in New York in October, emphasized how aeronautics, as it sets this pace in design, is enriched by and dependent upon the fundamental science of physics, and Edgar S. Gorrell, '17, speaking before the Transportation Conference at M.I.T. last June (The Review, July, 1936, page 401) showed inferentially how economics — an essential factor in all the engineering arts — takes its place along with aspect ratios, lift coefficients, and boundary layers in governing the development of designs on the drafting boards of aeronautical engineers. ¶ At the risk of supererogation we present these references as annotations to Messrs. Hunsaker and Mead's article, "Around the Corner in Aviation," which opens on page 65. In this preview of possible transport planes of the future may be observed the complex interplay of all the factors that enter into aeronautical design and the fascinating procedures that engineers follow in creating the superb equipment that flies our airway systems. ¶ The authors draw upon a rich and varied experience in aeronautics. It has been said that what goes on in the laboratory of GEORGE J. MEAD, '16, is aviation two or three years hence. He is vice-president and chief engineer of the United Aircraft Corporation and is in charge of engineering and research for affiliated divisions such as Chance Vought, Pratt and Whitney, Hamilton Standard Propeller, and Sikorsky. JEROME C. HUNSAKER, '12, designed the NC-4, the first aircraft successfully to cross the Atlantic, obtained the first doctor's degree in the field of aeronautics at the Institute, and built here the first wind tunnel in this country. Before coming to the Institute to be head of its Department of Mechanical Engineering and in charge of its course in aeronautics, Dr. Hunsaker was vice-president of the Goodyear Zeppelin Corporation and prior to that had been an officer in the Navy and had conducted research with Bell Telephone Laboratories. He holds an honorary fellowship in the Institute of the Aeronautical Sciences and is the editor of the journal of that society.

HISTORIAN of science, organic chemist, himself an example of a liberal education, Professor TENNEY L. DAVIS, '13, seeks a better understanding of the relationship between science and the liberal arts. His article is timely because of the extensive study that is being given at the Institute to the coordination of humanities with professional subjects. ¶ MARGARET PAIGE HAZEN, Reference Assistant, M.I.T. Library, who prepared the



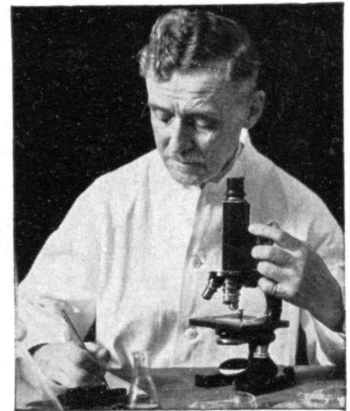
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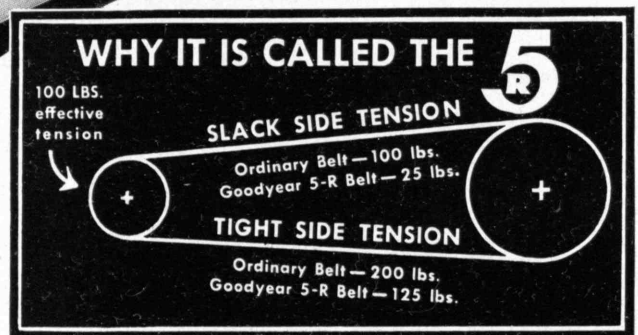
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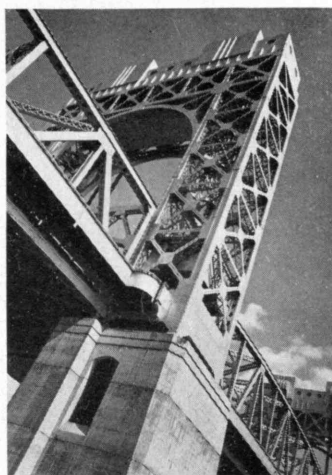
The “R” of a belt is the ratio between tensions on the tight or “pulling” side and slack or “returning” side necessary to maintain the effective tension required to operate the drive—and depends upon the coefficient of friction between belt and pulley. For example, an ordinary belt with an “R” of 2 must be operated at 200 lbs. tight side tension and 100 lbs. slack side, or a total of 300 lbs., to deliver 100 lbs. effective tension. The new Goodyear 5-R Belt is so named because its higher coefficient of friction gives it a minimum “R” of 5. To maintain an effective tension of 100 lbs., it requires a tight side tension of only 125 lbs. and 25 lbs. slack side, or 150 lbs. total—reducing bearing pressure and insuring longer belt-life.

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IN RUBBER

GOODYEAR



One way of seeing one
part of New York's Tri-
borough Bridge

F. S. Lincoln, '22

THE TECHNOLOGY REVIEW

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VOL. 39, NO. 2

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From a photograph, "Old Door Hinge," by Alexander J. Krupy

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GRANARY

Grain elevators, as many have remarked, are yet among the sights of Chicago — which presents so many striking sights to arrest or repel the eye. The colossal scale of these enormous store-houses does not alone account for their effect; there is an esthetic quality in their simple, functional geometry, a dynamic quality in their repetition of basic forms. Into them — if you do not know — "grain is elevated from ships or cars, sorted into grades, and reloaded for shipment, all of the work being done by machinery"

Margaret Bourke-White

THE TECHNOLOGY REVIEW

Vol. 39, No. 2



December, 1936

The Trend of Affairs

New Anesthetics

ANESTHESIA probably calls to mind more often the taking of ether or of gas (nitrous oxide) than it suggests other known means for producing insensibility to pain in surgical cases. Knowledge of the profound physiological effects of nitrous oxide dates back to 1799 and the times of Sir Humphry Davy. Before the middle of the 19th Century ether (sulphuric ether) had been used as a general anesthetic. At the Massachusetts General Hospital in Boston, October 16 is celebrated as Ether Day. On this day in 1846, Dr. J. C. Warren made a public demonstration of the use of ether in an operation. The very success of these two anesthetics over a long period of time has so dramatized their use that newer types of compounds may escape general recognition.

The past decade has seen an increasing use of special agents over the older and ordinary compounds. In one important American clinic the special agents have gained from 16% in 1925 to 52% in 1935, while the ordinary agents have declined in use from 84% to 47%. Practically all of the new agents have been synthesized by the organic chemists and their investigations are continually yielding still other compounds which have promise.

At the present time there are recognized new claimants for inclusion in each of the several general types of anesthetics. To the group of inhalation anesthetics the hydrocarbon, cyclopropane, has been added recently. Improved methods for synthesizing cyclopropane have removed this compound from the category of museum curiosities and made it available not only for the physician but for the scientific investigator interested in far different problems such as symmetry in the structure of molecules. Deep cyclopropane anes-

thesia is produced readily and is accompanied by very quiet, depressed respiration which is advantageous to the surgeon operating on the thorax or diaphragm. In spite of the value of this compound and of other similar vaporous organic compounds, there exists, always, fire hazard in their use. This fact, alone, greatly limits their practicability where the modern electric scalpel and other electrical devices are employed, and, at the same time, stimulates the search for equally effective but less dangerous compounds.

The class of intravenously injected anesthetics possesses certain advantages in the very method of their administration. Every new suggestion in this field is looked upon as having promise. While new representatives of this class have not shown great advance, the discovery of some very short-acting compounds gives hope that a profitable path may have been broken. These new compounds are derivatives of the barbiturates. Well-known examples of barbiturates are the hypnotics: barbital (veronal) and luminal. By producing certain definite changes in the molecules of known barbiturates the new short-acting compounds were produced. While their adoption by clinicians is not indicated at present, the field will attract further researches.

About 10 years ago Avertin (tribromoethyl alcohol) was thought to be the reward of the quest for a suitable compound for rectal administration. Its early use was attended by few difficulties, but later developments have put it in the class of anesthetics which are rarely best used alone. Its most important use lies in the production of a basal anesthesia, permitting surgery under a supplementary anesthetic of another type. There can be no doubt that other compounds will be sought to fill the need in this group.

Cocaine and novocaine are widely known as local



H. B. Kane, '24

NATURE'S MINSTRELS

Fledgling tree swallows in glum array pose for a theatrical portrait. Missing: two end men

anesthetics; the latter compound has proved to be most successful. In spite of this fact, new representatives of this class are being tried out. Recently a compound named metycaine was found to be very good for local work. Incorporated in ointments, it has been used successfully in treating surface wounds. Metycaine possesses the further advantage of having certain antiseptic properties — a fact which makes it especially attractive to clinicians.

Physicists on Parade

FIVE YEARS ago there were five principal societies for physicists. Most venerable of these, The American Physical Society numbered physicists of all kinds with perhaps a tendency toward emphasis on pure rather than applied science. Separate societies overlapping in membership laid separate emphasis on the applied physics of acoustics, optics, or rheology (deformation and flow of matter). A fifth society included those whose prime interest in physics was educational.

Meanwhile science was getting complex in every direction. With each year the physicists of the various groups tended to grow farther from each other: The Decibelians were becoming suspicious of the Nuclearites; neither understood the other very well; both were forgetting that they were all, under the skin, physicists — while the public looking at all this with some confusion was suspicious of physics altogether. At this juncture one great physicist had an idea. With the help of funds which, curiously enough, he obtained from the Chemical Foundation, he was able to start a new organization with the avowed purpose of reintegrating physics in America. This new organization was and is called the American Institute of Physics. It has, for a young society, achieved remarkably its aim of unifying and correlating the work of the five member societies which became the Founder Societies.

This October at the Pennsylvania Hotel in New York the American Institute of Physics held its fifth anniversary meeting. The theme of the meeting was one never sung before by physics in America. The burden of the lay was emphasis on the coördination of the various branches of physics, while the contrapuntal motif was the encouragement of their joint application to industrial research. Unspoken may have been the wish to demonstrate to the intelligent public that the high priests of physics are not all metaphysicists; that nuclear and cosmic research must and will have impact on the ordinary private citizen in his ordinary private life. The priests of chemistry had long known the merit of beating that particular ceremonial drum, and there seemed some danger that the priests of physics might, if they did not look out, lose some of their congregation.

Hence for the first time in many moons an American scientific society held a general meeting in which applied scientists — in this case industrial physicists — were really the headliners, though, of course, plenty of students in the fields of pure research were there. Many of them gave papers, too, but in these cases there was a conscious effort to relate what they were doing to something that the man in the street could understand.

In the pursuit of all these purposes formally or tacitly set forth, the meeting was admirably successful. The attendance was of the first order, both qualitatively and quantitatively. Successive symposia on the training of physicists for industry, on the applications of physics to seven large industries — glass, metals, oil, building, communication, electrical power, aviation — on optics and acoustics in modern science, and, finally, on the solid state were able to compete on reasonable ground with the simultaneous presence in the metropolis of both major candidates for the United States presidency. The papers for the most part recognized the rôle they were supposed to play: Almost none presented new material; they were not supposed to, as the symposia were more in



H. B. Kane, '24

FOR A NATURALIST'S ALBUM

Above. Indian pipes, common in New England's late summer woods, and behind them an obbligate of moss. Below. This tree frog, one of the *Hylas*, like the chameleon can change color at will, varying from white to black or from brown to green

the nature of a review than a revelation. None the less from a large amount of *résumé* material, much of which The Review has discussed before, certain colorful items might profitably detain the reader for a moment.

Both industrialists and educators were agreed, for example, that physicists, to succeed in industry, should be something more than physicists. They should possess the best possible broad basis of culture; should be able to use English so well as to present their ideas to executives not only clearly but persuasively. The suspicion that the scientist who talks well is perhaps no scientist should be dissipated. It was pointed out that while large research laboratories could profitably employ one or two nuclear physicists, they need many more physicists of the more pedestrian type — less spectacular workers in things like electronics and optics. Suggestive as a reason why physics did not enjoy its proper regard by industry was one of three given by Dean Dodge of Oklahoma's Graduate School: Chemistry with its origin in alchemy has almost from the beginning sought tangible goals while physics with its origin in philosophy has tended to create a schism whereby the theoretical physicist or thinker looked down upon the experimental physicist; yet the latter was the man that industry could readily understand. Even Archimedes, said Dean Dodge, for all the practical problem which set him upon his study of floating bodies, set the pattern for the scientific snob. According to Plutarch he repudiated "as

sordid and ignoble the whole trade of engineering . . . he placed his whole affection and ambition in those purer speculations where there can be no reference to the vulgar needs of life." From this sort of glory Dean Dodge urged a sensible retreat, and in the balance struck by the American Institute of Physics he found sound sense.

Of widest popular interest in the general symposium were papers by John Ely Burchard, '23, on building, by Dr. Clark B. Millikan on aviation, and by Dr. Jacob Pieter Den Hartog of Harvard on vibration in industry. Burchard enumerated the magnificent things applied physics had done for the equipment of buildings and found implied in present work an almost certain logical requirement that buildings of the future be windowless; he deprecated the little work that physics had done for modern structures, although pointing out the recent achievements in soil mechanics and seismological research, including the work of Ruge, '33, at Technology; he found reason for the lack of much applied physics in the art of building structures in the absence of well-to-do corporations whose major interest would dictate such research programs; and, finally, he pleaded for the brains of one great man — one man of the ability of several of the nuclear physicists — which applied to research in housing might perform a mighty service.

Most dramatic of the several revelations by Dr. Millikan had to do with the wrinkling of metal airplane wings. Millikan first pointed out that the stressed skin construction of the modern metal airplane wing resulted in a highly indeterminate structure so that methods of stress analysis must have recourse to the highly mathematical theory of elasticity. Moreover, the



H. B. Kane, '24



A. M. Prentiss

use of the thin skins with the very slender structural members of wings has resulted in tendencies toward local buckling. Such heavy penalties are imposed in air-plane design by the mere addition of material to cover factors of ignorance that these buckling tendencies have had to be investigated. As a result it has been found that all buckling need not be prevented; that, contrary to the views of classical design, buckling is not practically synonymous with failure; that kept within reason thin sheets may be permitted — in the language of Wagner — to “go into the wave state” under load without ultimate damage. He remarked that a passenger on a low-wing transport plane might well see waves appearing and disappearing on the upper wing surface as the plane flies in even moderately bumpy air, and he deprecated as being groundless any trepidation that this might cause in the mind of the passenger.

Dr. Den Hartog, an outstanding authority in the field of vibration, particularly in machinery, and an ingenious gentleman in the art of correcting vibration dangers, gave many examples of such corrections. Perhaps the most interesting of those described was the damper, now about a year old, devised for keeping within reasonable bounds vibrations in engines operating over a wide speed range. This consists of a piece of metal weighing several pounds and attached loosely to the shaft by one or more steel pins with a possible field of motion along the shaft of about one-quarter inch. When the engine runs, the loose piece vibrates back and forth rapidly, giving shocks to the shaft; the apparatus is so cleverly designed that these shocks are automatically in opposition to the shocks coming from the cylinders. Also of general interest was the recent work in the prevention of nosing (transverse sway across the track) of high-speed electric locomotives. Study of the problem was carried on with Lionel electric locomotives as models. The phenomenon is now understood and changes have been made to cure the difficulty in full-sized locomotives.



Chas. R. McCormick Lumber Company

DESPITE THE PASSING OF THE COVERED BRIDGE

... wood is still being used for highway bridges, as described in the adjacent article. On this and the opposite page are three striking examples of which the one shown above and to the left, the Vermont Street Viaduct in Portland, Ore., of composite concrete and wood construction cost hardly half as much as would reinforced concrete

Arthur C. Hardy, '18, presiding over the optics symposium, remarked somewhat humorously that there might not be any true science of electricity today had optics not been a branch of physics, for the great advances in electricity which had theretofore been a pith-ball science came when the search for high-efficiency light sources began seriously. This led neatly to Dr. Saul Dushman's description of recent work in high-efficiency light sources which has been described in *The Review* (December, 1935, page 90).

High lights from here and there: Den Hartog's graphic description of how disaster nearly overtook the Graf Zeppelin because of shaft vibration; the statement by German guest star Erwin Meyer (Berlin *Institut fuer Schwingungsforschung*) that vibration periods of a building tend, as you go up the building, to reduce themselves to one single frequency, and his further contribution to soundproofing with a wall made up of many plates separated by air spaces, with sound-absorbing material only at the edges and ends of the spaces; Gregersen and his dyes for the vascular system through the use of which and principles of optics he is able to make many valuable observations of the blood; Langmuir's compact and clear explanation of his thin-film research, of his hydrocarbon chains with their “hydrophilic heads in the water,” and of the significance of this sort of work in helping us to know more of the behavior of the cell wall in living tissue; Bridgman's account of high-pressure research and the many changes of state he finds under these pressures with the conclusion that we are unable to make any sound guess as to the constitution of matter in the deep earth beneath us.

The top moment of the meeting, however, came at the annual dinner. That dinner, over which Professor John T. Tate of the University of Minnesota presided, turned out to be a testimonial to the scientist whose thought and enthusiasm had brought about the Institute of Physics — without exception the scientists and their guests rose to acclaim him. That scientist was Dr. Karl Taylor Compton.

Wooden Bridges Stage a Comeback

THE REVIEW has several times commented on the rapid advances made on the West Coast in the structural use of timber. Through the courtesy of R. E. Cushman, '06, of Portland, Ore., who supplies the fol-

lowing information, we are able to point out the latest development in Western bridge design which has grown out of joint efforts of the Forestry Department, the Bureau of Public Roads, and the Oregon State Highway Commission.

Oregon has magnificent stands of Douglas fir, a ready supply of large and fine structural timber; Oregon is a young and growing state which realizes that it has not reached highway saturation; Oregon prefers to be frugal, to use her own materials, and to commit herself to no plan of highway bridges that cannot profitably be scrapped when expected expansion suggests it. Untreated timber bridges, though cheap, have short lives — too short. Reinforced concrete bridges are not cheap and will live too long. In this predicament, the Oregon State Highway Commission, in collaboration with research men at Oregon State College have devised a new composite type of bridge decking which combines concrete and timber in flexure.

For short-span bridges, the chief objective of the study, this combination may form the sole support. On longer spans the principles discovered may be employed with a supporting structure in the form of timber trestles, arches, or even timber trusses used with a cable suspension. In brief, the new composite beam is of the T type, the stringer or stem portion being of treated timber while the flange or deck-surface portion is of concrete. Evidently the chief problem in such a composite member is to bond the two materials together so that the longitudinal shear at the plane of junction may be withstood. Various devices were tried, among them the use of spikes projecting from the timber into the concrete; daps cut in the timber to provide mechanical pocket bonds; pipes driven into holes in the timber and projecting into the concrete; and combinations of these. As a result of the tests it has been concluded that pipes or combined spikes and daps are the best, and the latter have been adopted as a standard for reasons of economy. Since the research began in 1932, a number of bridges of this type have been constructed.

It is affirmed with conviction in a complete report on the matter published by the Oregon Highway Commission that the deflection of a beam of this type is but

one fourth that of a beam made of the same materials and dimensions but not bonded, while the strength of the composite is double that of the unbonded beams; that repeated or alternate loads have no detrimental effect; that temperature stresses can be provided for in design of the shear connection and with adequate longitudinal temperature reinforcement; and that transformed section formulas yield sufficiently accurate results within the working limits.

Coupled with this advance in economy, the Oregon engineers have had their minds on beauty. Most of the bridges are definitely handsome. Recognizing that of short-span bridges only the rails are seen by most of the traveling public, the engineers have carried the composite principle into the rails and have produced some worth-while results by making posts and rail caps of concrete and spindles or balusters of wood.

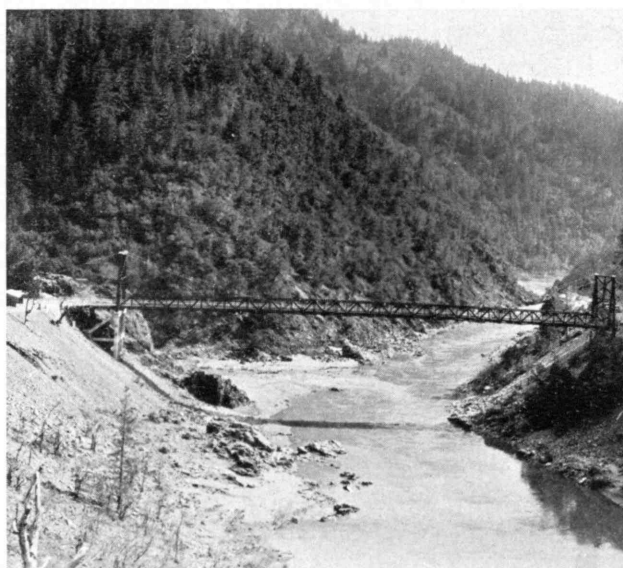
This adds up to the fact that Oregon is building composite bridges with an expected life of 30 to 40 years at a cost of about one half that of reinforced concrete bridges which will last 60 to 80 — too many — years, at a cost little over twice that of bridges of untreated timber alone. The latter are relatively unsightly, begin to deteriorate at once, and have a life of but six to 15 — too few — years. The choice seems a wise one.

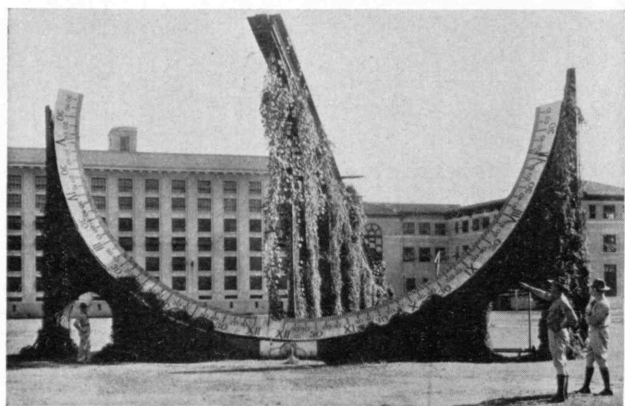
The bridges may be small individually, but they bulk large in economics. On ten typical primary highways in Oregon, for example, spans of under 30 feet constitute more than 50% of all the lineal footage of bridge structures. This is not far from normal for the country as a whole. Any saving of this sort, though small in increment, bulks large *in toto*.

As the art of wood preservation is old and established, so on the whole are its methods. No new preservative has yet come along seriously to challenge the supremacy of coal-tar creosote for most purposes. Again, pressure methods of impregnation still seem to be preferred by the most careful operators. The principal achievements with one exception have been in the writing of increasingly rigid specifications and in the refining of technique largely through elaborate research work carried on at the Forest Products Laboratory.

FOR ECONOMY'S SAKE

. . . these two graceful spans are built mainly of wood. They bridge respectively (right) the Rogue River in Siskiyou National Forest, and (below) the North Umpqua River, both in Oregon. Both structures were built by the United States Forest Service of treated Douglas fir





Fairbanks

"IT IS LATER THAN YOU THINK"

The world's largest sun dial (or so it would appear) as it stands adjacent to the University of the Philippines, Manila

Probably the only new development in the past many years is the process of incising, which is not really very new but has only recently been widely adopted and perfected. It consists in passing sawed timbers through a machine with cutting teeth on rollers. The teeth are pressed into the wood to form incisions at specified spacing and depth. The effect is to cut the wood fibers so as to expose some end-grain wood which is usually more absorptive of preservatives than other cuts. The spacing of the holes is an empirical matter, but they must be close enough so that the preservative will meet as it spreads from the holes and no closer than necessary so as not to weaken the wood too much. It is interesting to note that this process was patented by O. P. M. Goss in 1918, but that the patent was purchased by the Pacific Coast wood-preserving companies and dedicated to the free use of the public.

Back of this advancing work in timber one always detects the guiding hand of the Forest Products Laboratory which, with every passing year, demonstrates to greater degree its right to inhabit its handsome building in Madison, Wis., and its right to claim appropriations that will fill that building with more scientists.

The Ship's Propeller Turns a Century

COEXTENSIVE with the age of the United States Patent Office, which celebrates its 100th anniversary this year (see *The Review*, May, 1936, page 333), is the age of the ship's propeller. Although not of American origin, the screw propeller amply demonstrates the vast importance of the patent system which fosters the Lilliputian idea that is destined to grow to leviathan proportions. The first patents for screw propellers were granted in England to Francis Pettit Smith and Captain John Ericsson. Smith, who began experimenting with propellers in 1835, applied the following year for a patent on a device "to consist of a sort of screw or worm, made to revolve rapidly under water in a recess or open space formed in that part of the after part of the vessel commonly called the dead rising or deadwood of the run."

Thus began a new era in marine history, and Smith cannily visioning the possibilities of his invention, claimed the monopoly of any screw arranged singly or in

duplicate, "or otherwise placed more forward or more aft or more or less deep in the water." That was on May 31, 1836. On July 13, Ericsson, who as a matter of fact had operated a propeller-driven boat on the London and Birmingham Canal in a series of tests three years before, applied for a patent on a propeller consisting of "two thin broad hoops of short cylinders made to revolve in contrary directions round a common center, each cylinder or hoop moving with a different velocity from the other; such hoops or cylinders being also situated entirely under water at the stern of the boat, and each fitted with a series of short spiral planes or plates . . . to be kept revolving by the power of a steam engine."

Ericsson, according to Frank C. Bowen, writing in *Shipbuilding and Shipping Record*, had already demonstrated a somewhat similar form of his propeller on a two-foot model which churned its way about a circular public bath in London. Powered by steam supplied via a flexible hose from a boiler suspended overhead, the tiny craft created a sensation. While Ericsson gave public demonstrations, Smith, working less spectacularly on a pond on his farm near Hendon, decided he was ready to patent his invention and thus anticipated his rival by two months.

It was at this stage of his work that Smith exhibited his propeller on a model which was shown at the Adelaide Art gallery, where he won the polite but non-committal interest of Sir John Barrow, Secretary of the Admiralty. The Pasha of Egypt, however, acting through a British firm, immediately offered to buy all rights to Smith's invention. He was refused, and then began a period of competition between Smith and Ericsson which was attended by not a little bitterness on the part of the latter.

In the further development of his propeller Smith had a six-ton boat built and powered with a six horse-power engine driving a wooden screw of two turns. The vessel operated successfully on Paddington Canal to the delight of Londoners watching in complacent security from the shores.

The next important step in the evolution of the screw propeller came by accident in February, 1837, when Smith's little vessel, still operating on the Paddington Canal, struck a submerged obstruction which tore away about half of its propeller. The ship immediately leaped forward at a new and hitherto unattainable speed, and Smith, quick to realize the cause, at once set about designing a single turn propeller which showed great improvement over all previous models.

Meantime Ericsson, in the spring of the same year, had a 45-foot wooden steamer built, naming her the *Francis B. Ogden* after an American who had generously supported the undertaking. Equipped with two of Ericsson's rotary propellers, five feet, three inches in diameter, the vessel created a sensation by attaining a speed of ten miles an hour. To demonstrate the value of his propeller for towing, Ericsson hooked on to a 140-ton schooner which he towed seven miles an hour, and later tightened his towline on the bitts of the transatlantic packet *Toronto* to tow her at a speed of four-and-a-half miles an hour. But Ericsson, a former Swedish army (Continued on page 78)

Around the Corner in Aviation

Tentative Specifications for Two Transport Planes: Tomorrow's and Day-After-Tomorrow's

BY JEROME C. HUNSAKER AND GEORGE J. MEAD

DESPITE the depression, the past five years have been marked by great advances in the speed, comfort, and safety of air transport in this country, accompanied by a heartening increase each year in passengers, mail, and express carried by air. Capital has found in the aircraft industry one of the few hopeful fields of enterprise. However, anyone naturally wonders: "Can such progress continue?"

What is around the corner is an intensely interesting question to the intelligent layman as well as to the air-transport operator and the aircraft manufacturer. The rapid development of the airplane to date warrants great expectations, but these expectations must be limited by what is possible and to trends not projected too far into the future. The policies of more and more industrial enterprises are being influenced by the findings of their research groups who are sent ahead to explore new territory. Fortunately, the aviation industry is new, competition is keen, and rapid development has largely prevented standardization. The aircraft industry is, therefore, relatively free to anticipate new developments; in fact, it must keep a clear lookout ahead or it may find its product or services obsolete and undesired.

With such considerations in mind, the United Aircraft Corporation, one of the largest manufacturing companies in the industry, has maintained a research group since its inception, and the findings of that group have continuously aided in formulating the company's policies. Beginning over a year ago this group, assisted by the company's designers and by members of the aeronautics staff of M.I.T., undertook a study of the trend of transport airplane development. The United group has had very extensive experience in the design and manufacture of engines, propellers, and airplanes. The Institute has wind tunnels for testing airplane models, an engine test laboratory, and unique equipment for research in structures and strength of materials. The effectiveness of the facilities of the two organizations naturally depends on personnel. The two groups¹ included experts in general design, together with specialists in aerodynamics, engines, propellers, meteorology, structures, materials, acoustics, fuels, supercharging, and so on.

It is now possible to present some of the results of this study, together with a somewhat conservative projection into the future. The continuation of present trends is, of course, limited by the fundamental mechanics of flight, by the physiology of humans, by economics, and

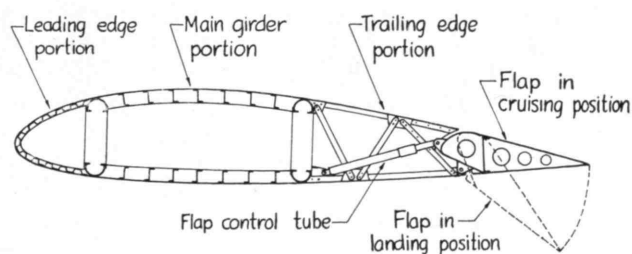
by geography. The situation is best presented in the form of a discussion of the design of the airplane that could be designed today — of proved components — for tomorrow's service, followed by a consideration of its probable evolution in the near future as more knowledge becomes available.

TOMORROW'S AIRPLANE

Requirements. Air-line experience has indicated the need for larger pay loads, greater cruising speed, and more passenger comfort, together with lower operating costs. The air-line requirements at the time this study was commenced were, therefore, taken as the basis for the design of Tomorrow's Airplane. These called for a low-wing monoplane with a pay load of 20 passengers and half a ton of mail and express, in addition to the passengers' luggage, making a total pay load of 5,100 pounds, to be carried from Coast to Coast overnight with two intermediate stops, without normally calling on the engines for more than 60% of their rated power. Day and night passenger accommodations were required to be at least equal to those of a Pullman car, together with toilet and dressing rooms, a completely equipped galley, provision for a crew of five, and the latest radio and navigation equipment.

A preliminary evaluation of the requirements indicated an airplane of about 40,000 pounds gross weight with a total engine power of between 3,000 and 4,000 horse power. A range of 1,250 miles in still air at a cruising speed of 225 miles an hour at an altitude of 10,000 feet was necessary to meet the proposed schedule of operation. With these specifications in mind, a survey was made of the art as it concerned the major components, to the end that the design of Tomorrow's Airplane represented the best combination and compromise.

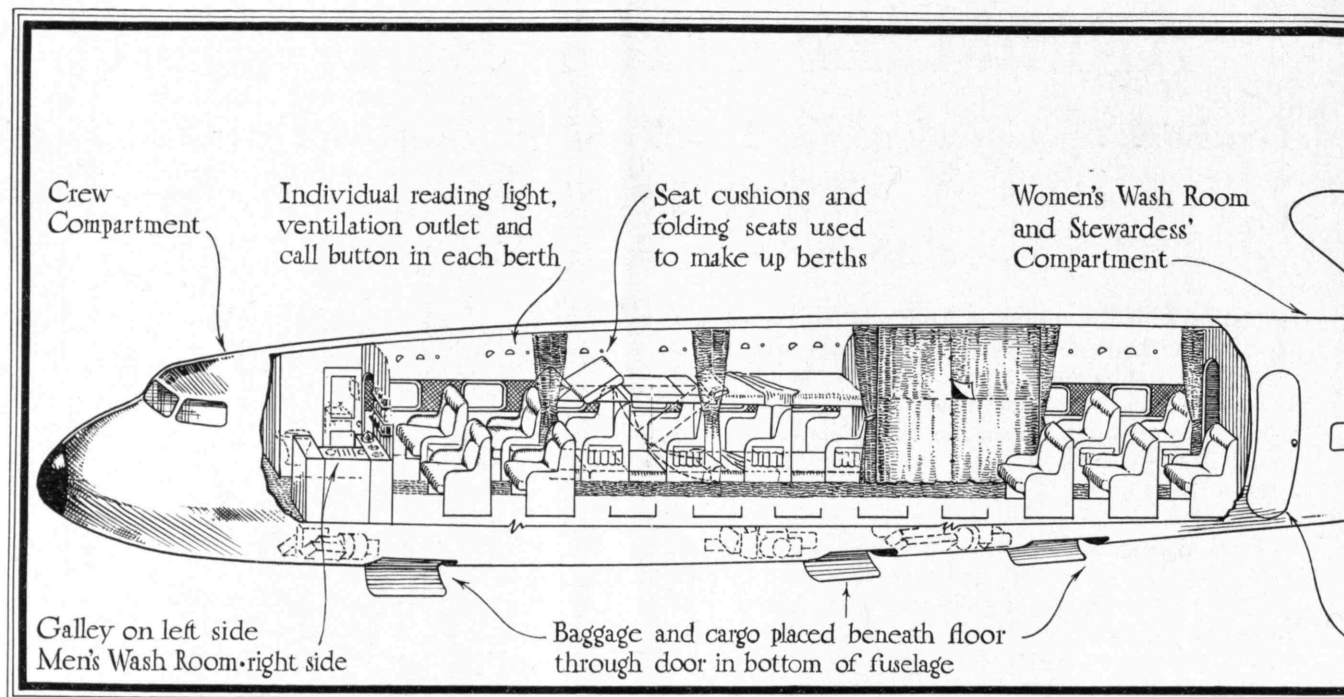
Wing. The best wing form for these requirements appears to be the modern double-cambered type developed by the National Advisory Committee for Aeronautics. Its fore-and-aft section is somewhat similar to that of a



THE WING

of Tomorrow's Airplane will embody highly efficient features already developed, notably the trailing edge flap which permits low speeds for take-off and landing, high speeds for cruising

¹ The combined group included the following: F. W. Caldwell, '12, C. H. Chatfield, '14, M. E. Gluhareff, C. J. McCarthy, '16, G. J. Mead, '16, T. B. Rhines, '32, I. I. Sikorsky, A. V. deForest, '11, J. C. Hunsaker, '12, O. C. Koppen, '24, J. R. Markham, '18, J. S. Newell, '19, S. Ober, '16, E. S. Taylor, '24, and H. C. Willett, Staff.



Zeppelin, although not symmetrical about the axis. Little further improvement is in sight in this basic wing form. As shown in the sketch on the preceding page, the wing is built in three sections, the middle one integral with the fuselage structure. Although the spars carry the major portion of the load on the wing, the metal skin contributes substantially to its strength.

Although no major improvement is anticipated by change in the contour of the wing itself, there is great advantage in means to vary the unit lift by mechanically increasing wing curvature for the take-off and the landing. The resulting high wing loading, due to small wings, goes far towards stabilizing the ship in rough air and promoting passenger comfort. The wings will have as high an aspect ratio (ratio of span to depth) as is practicable in the interest of efficiency. In addition, the designer must make the wing area as small as he dare, to keep down the weight of the wings and the power used to force them through the air. The wing area needed to carry a given weight depends on the curvature and on the square of the speed. If the wings are strongly curved, their unit lift is greater, but so also is their resistance. A strongly cambered wing is unsuitable for high speed, but is very desirable in meeting the Department of Commerce limitation on landing speed (65 miles per hour). Modern American transport airplanes owe much of their superior performance to a trailing edge flap which, in effect, gives variable camber to the wings. This device was, therefore, chosen. For landing and take-off, the flap is turned down, but at cruising speed the flap forms a continuation of the normal wing contour. The flap construction is shown in the wing sketch on the preceding page.

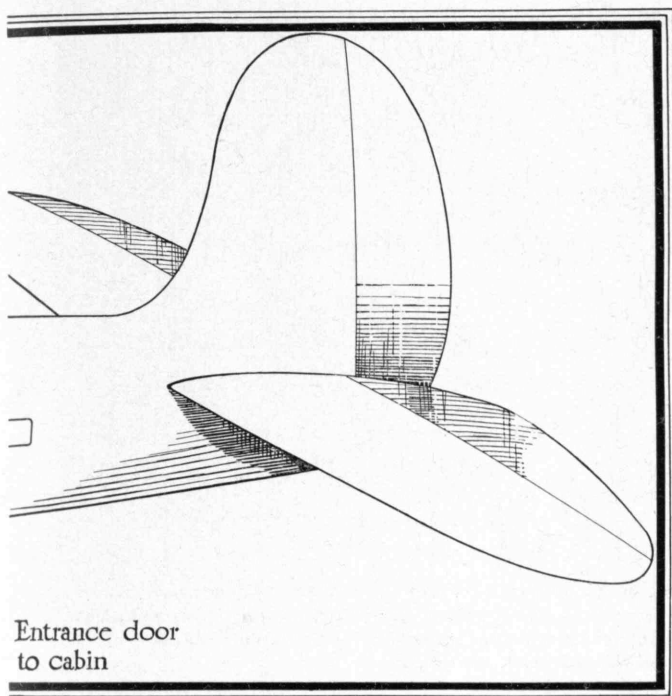
The desired reduction in wing area is limited by the required altitude of flight and by landing conditions at the airports. The normal cruising altitude will not exceed 10,000 feet because of the physiological limitations

of the passengers, but to avoid local bad weather, altitudes of 15,000 feet may be necessary for limited periods. Tomorrow's Airplane should be able to fly easily at 15,000 feet, even with one engine dead.

Only first-class airports will be used by such a large airplane, but one stop on the transcontinental run might be at a 6,000-foot elevation. The wing area was designed to ensure that the airplane with full load on board could take off within present Department of Commerce regulations on any of the airports likely to be used. We did not anticipate larger airports, longer take-off runs, or abandonment of ability to use emergency fields. The wing area, nevertheless, was cut down until it supported in flight 24 pounds per square foot.

A few years ago the wing loading of transport airplanes was of the order of 10 pounds per square foot or less, and persons who remember vividly a possibly embarrassing experience in rough air may well reconsider their vow of "never again." The present Douglas planes, loaded from 20 to 24 pounds, are an enormous improvement. A still further increase should soon be possible. Indeed, Mr. Sikorsky has shown that for his flying boats, which are not limited by the dimensions of landing fields, the wing loading may safely be pushed up to 30 pounds, with corresponding gains in steadiness and passenger comfort.

Fuselage. The most desirable fuselage shape is undoubtedly the fish-shaped form used by Zeppelins. For the airplane this optimum form must be modified to afford adequate view for pilots and a sufficient cross section at the extreme stern to support tail surfaces. Wind-tunnel work at M.I.T. indicated that these necessary departures from perfection involved an increase in fuselage drag of only five per cent. The structure consists of a stressed aluminum alloy skin kept in shape by bulkheads and longitudinal stringers. In cross section



Entrance door
to cabin

the fuselage is nearly circular and externally it is smooth, without projecting door handles, rivet heads, window frames, or other usual projections.

Control Surfaces. The conventional type and location of tail surfaces are apparently still the most desirable, and the best modern practice was accordingly followed. Small controllable flaps or tabs are provided on the trailing edges of elevator and rudder, so that the effects of variations in loading and engine operation may be compensated for to maintain perfect balance. Tail surfaces, like the wings, are of metal construction without external bracing.

The ailerons are likewise of conventional design, but are covered with fabric instead of metal. With fabric covering, only a moderate amount of weight need be added at the leading edge of the aileron to secure the mass balance of this surface about its hinge that is essential to eliminate aileron flutter.

Cleanness. Wind-tunnel tests indicate the importance of extreme smoothness of the exterior of the airplane. Such small projections as rivet heads would increase by about six per cent the power required for an airplane of this size and speed. In the design of Tomorrow's Airplane all obstructions are removed, flush rivets used, and the greatest care taken in blending or fairing one surface into another to avoid interference with air flow.

Landing Gear. The landing gear is completely retracted when in flight and is smoothly housed in the underside of the wing. The tail wheel is likewise retracted. The current practice of retracting the main landing gear wheels only partly into the wing was found, in this case, to involve an increase of 20% in power required for cruising.

Power Plant. The number of engines to be used was given serious consideration from the operating standpoint. It was finally decided that four engines were most

TOMORROW'S AIRPLANE

should be 50 miles per hour faster than today's best, fly 50% farther nonstop, afford more passenger space without appreciable increase in operating cost, offer more creature comforts through such Pullman-like facilities as those shown in the adjacent sketch. The Future Airplane, born of Tomorrow's, will, as the authors envisage, embody great savings in power (which means decreased operating costs) and provide yet greater passenger comfort as a result of wings more heavily loaded

desirable for passenger service, since, in the event of failure of one, there still remained 75% of the total power available instead of the 50% available in the present standard twin-engine machine. Four engines were found particularly attractive because Tomorrow's Airplane must be able to maintain its cruising speed with only 60% of its total power. This means that schedules could be reasonably well maintained even in the event of one of the four power plants going out of commission. A greater number of engines would not provide a comparable increase in safety and, therefore, would not justify the additional complication in this size of airplane. An uneven number of engines is undesirable since such an arrangement places one power plant in the nose of the fuselage to the detriment of pilot vision and passenger comfort. Fourteen-cylinder two-row radial engines of an existing type, normally rated at 900 horse power, were chosen because of their small diameter (which permits superior propulsive efficiency), the large amount of surplus or emergency power available, inherent smoothness, and light weight.

For the service under consideration, a take-off power of 1,000 to 1,100 horse power per engine is considered essential and is equally necessary at high-level fields as well as at those near sea level. For safety the take-off power should be available continuously for several hours in case of necessity, and even greater power may be required of the engines in an emergency. The engines have a fuel consumption at cruising speed of .44 pounds per horse-power hour on 87 octane fuel and are provided with automatic power and mixture controls to insure this low consumption being maintained in service. To control engine temperatures in flight, flaps are provided on the engine cowls which control the flow of cooling air around the cylinders, and automatic control is provided for the temperature of the lubricating oil.

In this size of airplane, pusher propellers were found impracticable; therefore, tractor propellers are used and the engines mounted substantially abreast in individual nacelles on the leading edge of the wing. Each engine drives a three-bladed constant-speed metal propeller through a reduction gear at about half crank-shaft speed. The best possible propeller efficiency was of the utmost importance, and this dictated both the propeller diameter of $11\frac{1}{2}$ feet and the gear ratio of 0.57, since under these circumstances a propulsive efficiency of 86% is found possible. The constant-speed device, with which the propellers are fitted, permits the pilot at any time to select engine speed independently of throttle opening. This feature is valuable in enabling the engines to deliver their maximum power in take-off and in climb.



FISH-SHAPED

Tomorrow's Airplane should look like this with its Zeppelin-like fuselage. The Future Airplane should be similar but with narrower wings, with engine cowls much reduced in diameter, and with the pilot's cabin faired into the body form. There are, as the authors point out, social and political implications in the potential availability of a common carrier to travel between any two points in North America overnight, to bring Europe within 24 hours

The simplest fuel system is provided, namely, a fuel tank for each pair of engines integral with the wing in the box spar, giving a total capacity of 1,000 gallons. Each engine has its own oil supply carried in a tank immediately behind it in its own nacelle.

Passenger and Cargo Accommodations. As shown by the sketch on page 66, at the forward end of the fuselage is a cab for the pilot, the copilot, and the radio operator. Aft of the cab are the galley and the men's dressing room, followed by the main passenger cabin containing 10 sections of two berths each, like those of a Pullman. At the rear of the main cabin are the passengers' entrance and the ladies' dressing room. The size of the main cabin, as dictated by requirements for improved habitability, worked out to be 10 feet wide and 40 feet long. The main cargo space is beneath the cabin floor.

The required sound level of 65 decibels at maximum cruising power in passenger cabin and crew's quarters is provided by sound insulation both in structure and ventilators. A complete heating and ventilating system is also included, capable of maintaining a cabin temperature of 70 degrees F. with an outside air temperature of 0 degrees F., and a ventilating air flow of 40 cubic feet per minute per passenger. At lower outside temperatures 70 degrees is maintained with less ventilating air. As there is no engine attached to the fuselage and each engine is insulated from its mount by rubber, little or no vibration can reach the passenger cabin. A large window at each seat ensures light and view.

Weight. It will be apparent immediately that the airplane structure and the power plant by no means account for all the dead weight, and that the navigation and radio equipment, the interior furnishings, and the other provisions for the safety and comfort of the passengers entail substantial weights that might otherwise be devoted to pay load. These weights are distributed as follows:

TABLE I

	Per Cent of Gross Weight
Structure	25.7
Power plant	23.0
Crew and passenger equipment	11.7
<hr/>	
Total dead weight	60.4
Useful load	31.2
Manufacturing and equipment margin	8.4
<hr/>	
Total	100.0

Performance. The major characteristics of Tomorrow's Airplane are shown in comparison with those of two current transport airplanes:

TABLE II

	Tomorrow's Airplane	Type A	Type B
Gross weight, pounds	39,280	18,200	13,650
Useful load, pounds	12,260	6,190	4,515
Crew	760	340	465
Fuel and oil	6,400	2,405	1,600
Passengers	3,400	2,380	1,700
Baggage	700	490	300
Cargo	1,000	575	450
Cruising speed, miles per hour	225	179	182
Total rated power	3,600	1,420	1,100
Per cent of rated power required for cruising	60	62½	74
Range, miles	1,250	825	745
Direct operating cost ² cents per ton-mile of pay load	23	20	24

² Not including administration, traffic, communication, and other elements of expense unaffected by airplane design.

Perhaps the most outstanding improvement in performance of Tomorrow's Airplane over that of airplanes now in service is the increase in cruising speed and non-stop range without appreciable increase in operating cost. The pay load has been (Continued on page 80)

Toward a Liberal Education

Relations of Science to the Humanities

BY TENNEY L. DAVIS

THE student of science has a particularly favorable start in the pursuit of a liberal education. Habits of rigorous thinking and an acquaintance with things as they are, and with phenomena in the ways in which they happen, give him at the outset the foundations upon which, uniquely, an evaluating judgment may be developed. For him the chances are better than for others that education will make him a humanist and a humanitarian, a pleasure and a profit to himself, a sagacious leader of his fellows, a weigher of consequences, and a pointer out of directions. The conclusion that science supplies the surest start toward a liberal education appears to follow fairly directly from a consideration of the terms which are involved in the discussion.

At the colleges the students receive an education, but receive is not altogether the right word, for the students' part in the process is an active one. We ought rather to say that they acquire more or less of an education according to their taste and their ability and they receive much training in addition to that which they have already received in the primary and secondary schools. In speaking of training, receive seems to be the proper word, for training is something that is imposed upon the student in a manner that education cannot be imposed. Students are made to go through their steps and their paces and their drills in order that they may learn the correct ways to do things, the correct way to manipulate chemical substances or to carry out a qualitative analysis, the correct way to solve a problem of areas or of stresses, the correct way to apprehend the meaning of a piece of writing in a foreign language. They learn at our higher institutions the technique of doing many things rightly and well; they learn the technique of procuring the answers to questions of fact. This learning we consider to be the result of training, not of a process of education, for its practice requires little or no exercise of an evaluating judgment. Knowing how to do things does not make an educated man. Knowing what to do comes nearer to it, but that implies no superiority in the knower unless there are ways and better ways, or alternative modes, of doing the thing — and commonly there is only one right way. Knowing what to do is of little value anyway unless one knows also how to do it. A satisfactory education presupposes an extensive and rigorous training.

The distinction between military training and military education is recognized everywhere. There are thousands of men in the country who have had courses in military training; they have learned to do the things that a good soldier is obliged to do. The number of those who have had a military education is much smaller, limited perhaps to the graduates of West Point and of other military academies. Much smaller still is the

number of those who are military-educated in the practical sense, to whom the military education has stuck in a manner to determine conduct and judgment, in a manner to function as education properly functions in making them masters of the field in which they are educated. The number is probably not very much greater than the number of the generals. The soldier's training fits him to take orders and to do the job which is assigned to him. The general's education qualifies him to give orders and to plan the campaign. The same distinction may be applied serviceably at our institutions of higher learning where we train the students in order that they may be useful in the world, where we train them also for the greater purpose of making them receptive to the education which we hope that they will acquire. No amount of training imparts an education, but the training determines the quality of the education which may be erected upon it. The student, moreover, cannot be coerced into acquiring an education as soldier and student alike can be coerced in their training.

Some years ago Professor Arlo Bates, poet and literary critic and head of the Department of English at the Massachusetts Institute of Technology, gave a short course in esthetics, meeting once a week at the end of the day. He gave informal, illuminating talks to a small group of students who professed to be interested in the subject. Perhaps we were interested rather in anything which this great teacher might have had to say. Professor Bates discussed the appreciation of beauty, but prefaced his discussion with remarks on the relation of such appreciation to education in general. He argued that education is an appreciation of excellence, a sense of values. An educated person is one who is capable of distinguishing the excellent from the inferior, the more valuable from the less. The process of getting an education is the process of getting the judgment to discriminate. This notion of what it is that constitutes an education is probably very ancient. It has an Aristotelian sort of necessity about it, for whoever denies it asserts the value of some other special kind of education or instruction and by implication the preëminent value of a sense of values. It is a notion from which it is difficult to escape. It appears to be widely accepted and to represent the ideal toward which educators everywhere are now and always have been striving. The liberally educated person is one who can evaluate the humanly important things. He has good judgment within the field of the humanities.

Training is for action; education, for understanding. Training makes a man of service to others: he can take directions and accomplish a piece of work. Education of course also makes a man of service to others, for one who can point out the thing which ought to be done is an extremely useful citizen. But education has more value

than that: It makes a man useful to himself. The *gourmet*, gastronomically educated, finds pleasure in food and drink. The liberally educated man may find pleasure in everything that he does. Like the gods who know good and evil, he has access to genuine values. His education is an investment which will pay him dividends whenever he may wish to collect.

In the present article it seems unnecessary to defend the proposition that "the proper study of mankind is man" or to set forth arguments in favor of the age-old truth which Protagoras stated that "of all things the measure is man, and of man the measure is all things." Space will not permit us to array the evidence which gives inductive support to the belief that the fundamental human urges, the motives behind man's conduct and the stimuli which set them into action are now the same as they always have been. The essential character of man has not changed in any significant respect during the period of recorded history. However, no short-range view of the present and the near-present can be expected to yield a comprehensive understanding of human urges. Those which are dominant today are not those which were dominant yesterday, and those which were dominant yesterday, hidden now beneath the surface, determine complexes, inhibitions, and overt acts for which the motives are often difficult to discover and play perhaps a greater part in the present than the urges which appear for public discussion. The long-range view of history is necessary. "Don't read the Times," said Thoreau, "read the Eternities."

Professor Frederick Barry, in the first of two brilliant articles in the Columbia University *Quarterly*, after weighing considerations which we are unable here to review at length, reaches the conclusion "that for all purposes of understanding, apart from action, the study of history is essential." In the second article he discusses the problem "of determining the kind of historical studies which will best serve our higher educational purposes."

"A science of history . . . must have its basis in the history of events, which is most clearly presented as political history; and this, for the purpose of revealing natural causes is most intelligently interpreted, first of all, with reference to human needs, that is economically. Unless such interpretation is to be frequently misleading, however, it must be followed by further investigation into the apparently independent effects of human emotions and aspirations. That is to say, the political presentation and economic interpretation of history must be supplemented by a psychological interpretation based upon the data of the cultural anthropologist. . . .

"Now among all . . . factors of culture, which, with reference to its continued progressive development, is most significant? The answer to this question is not far to seek. . . . Quite evidently, the only aspect of history which has a cultural significance beyond the range of ecological interest is the psychological, and of this the intellectual aspect alone is uniquely characteristic of human history. This simple fact is conclusive. Without the labor of argument, therefore, we may conclude that the development of human intelligence is of all history's concerns the most important. . . .

"The effective thought of mankind at large has been, normally and almost exclusively, empirical, analytical, inductive. The scientific habit of thought is nothing more

than a critical, consistent, and systematic development of this common thought, as Huxley once said. The growth of the knowledge it produces, moreover, is accumulative; and because it is the only aspect of developing culture in which progress is actually demonstrable — a point which I wish again to emphasize — it is the basic condition of change in the development of all arts and social innovations. On this account also, therefore, and not only because its appeal to common sense is strong, it best serves as the background of any historical study of cultural development, excepting on the political and economic side. . . .

"The final inference to be drawn from all this discussion . . . appears to be that of all the comprehensive cultural disciplines none is quite as important as the history of science. This conclusion, though somewhat startling, is so satisfactorily definite, so unequivocal, and has about it such a vigorous and wholesomely uncompromising assurance, in a word such an engagingly youthful flavor, that it seems too bad to spoil it by timid reservations such as those to which the ageing are addicted. But in view of the fact that arguments based upon wide generalizations perhaps too precisely stated are not a little treacherous, it might be wiser to say that among comprehensive disciplines none, probably, will be more useful as the basis of a critical survey of higher culture than the history of science."¹

Professor Barry's argument has thus brought us to the point with which the present article commenced, namely, that students of science have a particularly favorable start in the pursuit of a liberal education. Their acquaintance with exact and concrete information and their familiarity with habits of rigorous thought put them in a uniquely advantageous position for the study of the most humanistic of all subjects.

A training in science is prerequisite to an education in the humanities.

The same conclusion rests also upon other considerations. It may perhaps be even more acceptable and clearer in its implications if we approach it "with modesty enough and likelihood to lead it" by discussing in greater detail some of the necessary interconnections between training and education, and the relations of both of these to the broad field of the humanities.

Students coming to college have already had a large amount of training: of training for life, of training among other things for education, of training for the business of acquiring the power to evaluate critically man, man's work, and man's world. They have also had considerable education, that is, instruction tending to develop in them a sense of values. As part of their training they have learned to read and write, to some extent to observe; they have acquired the means of access to knowledge. They have learned how to care for their own bodies in order to do the job in hand more efficiently. They have probably learned something of the care of the mind and are able to a limited extent to control its workings, to turn it from one use to another, to concentrate in their study. They have learned to practice the common social usages. At college they must receive more training still in order that they may in the end be able to get an education out of it — and this is the case whether the education which they seek is a liberal edu-

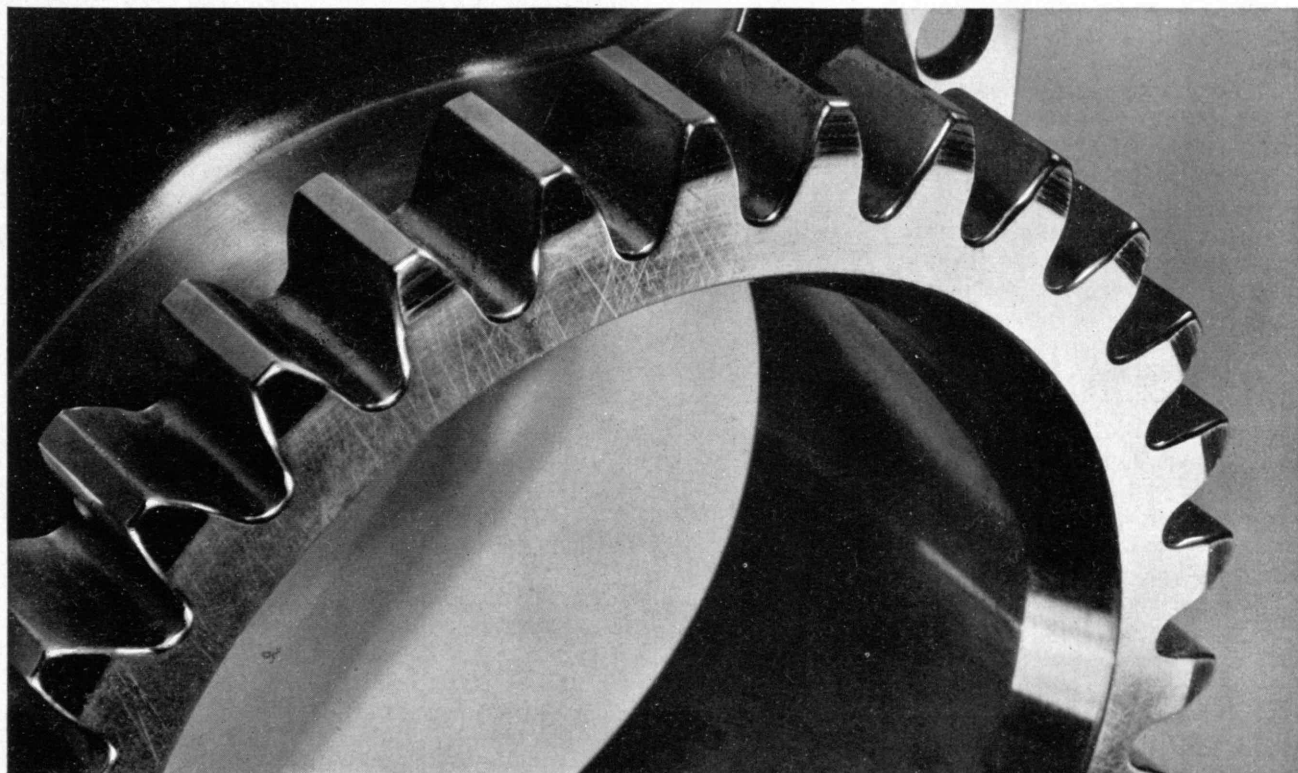
¹ Frederick Barry, "A Short Critique of the History of Science," Columbia University *Quarterly*, June and September, 1934, pp. 26, 95-111, 259-278.

education in the humanities or a specialized education in some one of the branches of science or engineering, in architecture or in theology, in medicine or in the law.

Much of the training which students receive before they come to college is of such sort that it tends to qualify them for whatever they may later undertake to do. So also is a considerable portion of their college training. Courses in hygiene, in mental hygiene, in logic, in history, and in composition and rhetoric are often wisely required during the first and second college years, courses in mathematics and in one or more of the fundamental sciences, physics, chemistry, and biology. These courses increase the student's grasp by giving him new information. They teach him how to do things. To the extent that they are informative they are of the nature of training. To the extent that they are interpretative — and at the colleges they ought to be so — they are of the nature of education in themselves. A course in composition and rhetoric will help a student of the law in the preparation of his briefs, students of theology and engineering in the preparation of their sermons and reports respectively, and a student of science in the exposition of his findings. It is useful to all of them. Moreover, it is prerequisite to advanced humanistic courses in fine literature. If a student can be exposed to instruction in composition and rhetoric and not acquire some taste for fine literature, some appreciation of the beauty and vigor and clarity of language, then something is radically wrong with the student. And it sometimes happens. Attaching no value to anything except what he judges to be practical and useful, it is difficult to inculcate in him an appreciation of the extrinsic value of the immaterial and "unessential." Yet, if it is not somehow and somewhere done, he is forever

excluded from reaping the advantages of a liberal education, eminently practical advantages indeed. Courses in physics and chemistry are an important part of the professional training of an engineer. Yet something is wrong if a student of engineering can take such courses and not become a fuller and a wiser man by gaining some understanding of the method of science, of the usefulness of abstract concepts, of the value of suspended judgment and unwavering integrity. There is a point here which ought to appeal to those who desire efficiency. Courses of instruction which are absolutely necessary for the training of a specialist contain also material which tends to educate him in his specialty, to give him good judgment in his particular field — and this same material may help him toward a liberal education. If the courses fail to help him in this latter direction, then something valuable has been needlessly lost.

The liberally educated man has something which can be communicated but of which he cannot be deprived: inner resources, immaterial possessions. If a student when he comes to college has an awareness of the enormous power and value of inner resources, he will find a liberal education in the courses which are needed to make him well trained and well educated in his specialty. If he has not this awareness, it is the difficult job of the educational institution to develop it in him. He will have it if he comes from a home where books are read and discussed, where abstract ideas are evaluated, and excellence appreciated. He will have it if his early teachers have been wise, as priests of the church are wise whose lives are dedicated to the promotion of spiritual values. He will have it also if he has grown up in an environment, perhaps even an impoverished one, in which propriety and good judgment count for more than strength and the dynamic ability to do. (*Continued on page 89*)



Margaret Bourke-White

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

EDITORIAL NOTE: The Review last month presented an abridgment of President Compton's significant program of objectives for the Institute, which will require the raising of a fund of \$12,500,000. In following our proposal to publish details of the various projects from time to time, we give below a more complete presentation of President Compton's plans for additional fellowships. This project, calling for a capital fund of \$1,500,000, will permit extension of educational opportunities to students of the very highest ability for graduate study and investigation of problems of exceptional interest.

Opportunities for Fellowships

A CONSIDERABLE portion of our elementary teaching and laboratory program can most advantageously be carried on by young instructors under experienced supervision. By and large the ablest, most alert, and most effective young men whom we can find for such teaching work are men who, at the same time, wish to pursue their advanced studies and research toward their doctors' degrees. Their appointment as half-time teachers has many advantages: As a rule they are decidedly successful in their teaching work and laboratory supervision and they gain valuable experience, not only in crystallizing their scientific concepts but also in acquiring poise and confidence. Their teaching has a freshness and enthusiasm which reacts well on the students. At the same time the plan enables these men partially to finance their post-graduate studies — an important item since they have so recently faced the expense of undergraduate education.

"There are, however, some difficulties inherent in the present half-time instructors plan. The teaching and laboratory instruction which they are called on to do is of a rather routine nature and, after two or three years, it is likely to lose its appeal, with the result that the teaching work is not then done so satisfactorily. At the same time the young man is becoming intensely involved in research underlying his thesis and finds teaching work difficult to carry on simultaneously with the proper care and enthusiasm. If this plan of combined teaching and graduate study is continued to the doctorate, five or six years are generally required — too long a period from a young man's life at this stage, unless no more satisfactory method can be found.

"We believe that a more satisfactory method can be found for securing even more desirable men for these posts and for alleviating the difficulties which I have mentioned. It is proposed that the most promising of these men who have held part-time teaching, part-time graduate-student positions for two or three years be awarded fellowships for the last year of their work for the doctorate. These fellowships should be large enough to meet approximately the necessary expenses for the year's study, so that this selected group of men may devote their last year to complete concentration

on their study and research. The direct and indirect results of such a plan would all be excellent, first in securing the best personnel and then in the training of these graduate students and in their teaching or laboratory supervision of undergraduates.

"A second type of fellowship is desired for students who have taken their degree, master's or doctor's as the case may be, and who have become involved in some investigation of such interest and promise that it becomes a pity to detach them from the work at this incomplete stage. Such detachment means an hiatus or perhaps a cessation in the investigation and at the same time it deprives the student of the benefit, satisfaction, and prestige which he would gain from carrying his work through to completion. It is proposed, therefore, to make available a certain number of research fellowships, for assignment as occasion warrants, to permit some of our best students to continue work on some of the most important research projects in our program for a year following the award of their master's or doctor's degree.

"A third type of fellowship is desired to extend and place on a more permanent basis the system of honorary sponsored fellowships which has been given a decidedly successful trial on a small scale in the Department of Business and Engineering Administration. Two ideas are basic to these fellowships, the one having to do with the selection of the fellows, and the other with the educational program made available to them. The fellows are selected from business and industrial organizations with coöperation of the management and are preferably from two to five years out of college. Thus an exceedingly promising young employee is given leave of absence for one year by his employer in order to carry on, under the fellowship, advanced study of business and engineering administration leading to a master's degree at the Institute. While here, he is not only given the best program of study which the Institute can offer, but at the same time he is given an opportunity to make personal contact with a considerable number of the most interesting and successful business executives, through a well-developed program of social gatherings and small group discussions.

"This plan carries into the training of young men for business positions something of the same advantageous experience gained by the young doctor or the young lawyer in his period of internship or apprenticeship, when he has opportunity to observe the work of the best men of his profession. Hitherto such an advantage has not been given the young apprentice in a business organization, since he commonly comes early into contact only with the lowest grade of business executive. The experiences of the small group of honorary fellows during the past five years and their very remarkable record of success immediately following their fellowship year are ample evidence of the sound-

ness of this educational program. Funds for the fellowships are essential, however, since the young men who can most benefit by this program are in general unable at this critical stage in their careers to make the combined sacrifice of loss of earnings for a year and payment of tuition. These fellowships are believed to be good educational investments in the men and an educational experiment worth carrying out. If properly financed, the plan may well rival, in influence and value, such outstanding fellowship programs as the Commonwealth, Guggenheim, or National Research Fellowships, or the Rhodes Scholarships. Its trial on a small scale at the Institute has aroused a good deal of interest in America and in England among groups concerned with the future of management in business and industry.

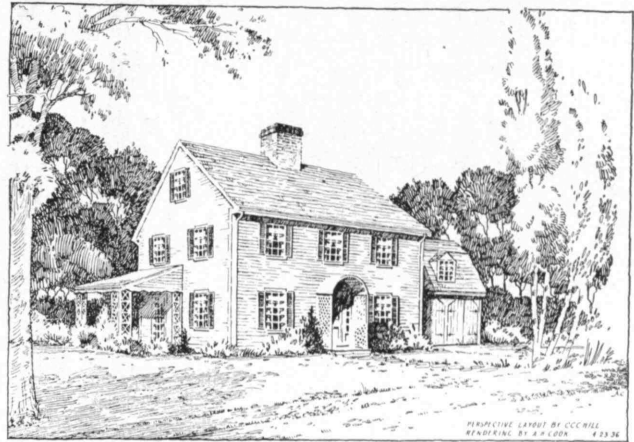
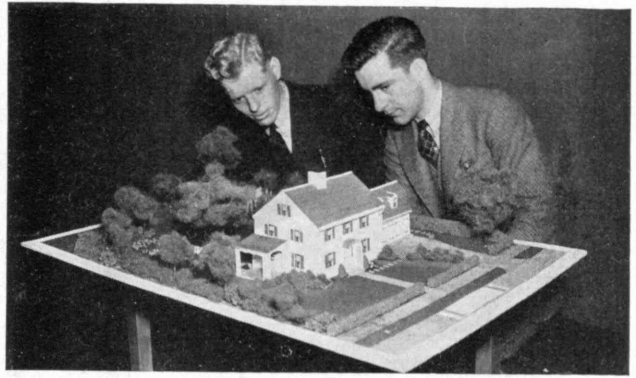
"Finally, as a supplement to our existing undergraduate scholarship and loan plan, I would recommend the addition of a limited number of prize scholarships open to students in the senior year. These should carry something more than full tuition, as for example, \$750 each. Since the Loan Fund has been open practically only to men above the freshman year, the Institute has been gradually shifting awards from undergraduate scholarship funds into the lower years. In particular, the number of freshman competitive scholarships and regional scholarships has been greatly increased as a means of drawing desirable students from all parts of the country and of stimulating our alumni representatives to exert their best efforts in steering desirable student material to the Institute. Thus the funds remaining for scholarship awards in the upper undergraduate years are considerably reduced. It is true that the Loan Fund is quite ample to take care of cases of necessity, as far as tuition is concerned. The best educational practice, however, should supplement this with scholarship awards made definitely as incentives and prizes to scholastic work of very high order, and I believe that our educational process would be definitely improved if a few undergraduate scholarships of a more outstanding type were provided."

The Commuter Shows His Mettle

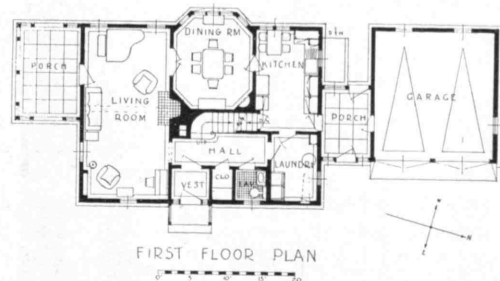
BY LEICESTER F. HAMILTON

REFLECTIONS sometimes cast upon commuters as a group at the Institute, which have tended to brand as "brown-baggers" students who live at home, travel distances morning and night, and are under the constant guidance and often restraint of parents, have been challenged by a survey of the extent of participation in undergraduate activities of the three recognized groups at M.I.T.—the commuters, fraternities, and dormitory residents. As a result of this survey, some significant conclusions have been drawn which indicate that the words "commuter" and "brown-bagger" are by no means synonymous.

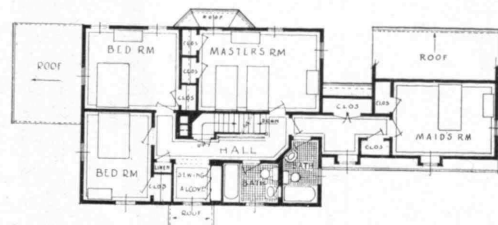
As a group, the commuters are interested in and have ample time for athletic competition and activity positions. They have demonstrated that they are capable and efficient organizers, and that geographical location does not confine their efforts to the college sphere, as they are also leaders in public, fraternal, and social



MASSACHUSETTS INSTITUTE OF TECHNOLOGY - SCHOOL OF ARCHITECTURE - STUDENT HOUSE 1935-36
WOODLAWN AVENUE, WELLESLEY MASS.



FIRST FLOOR PLAN

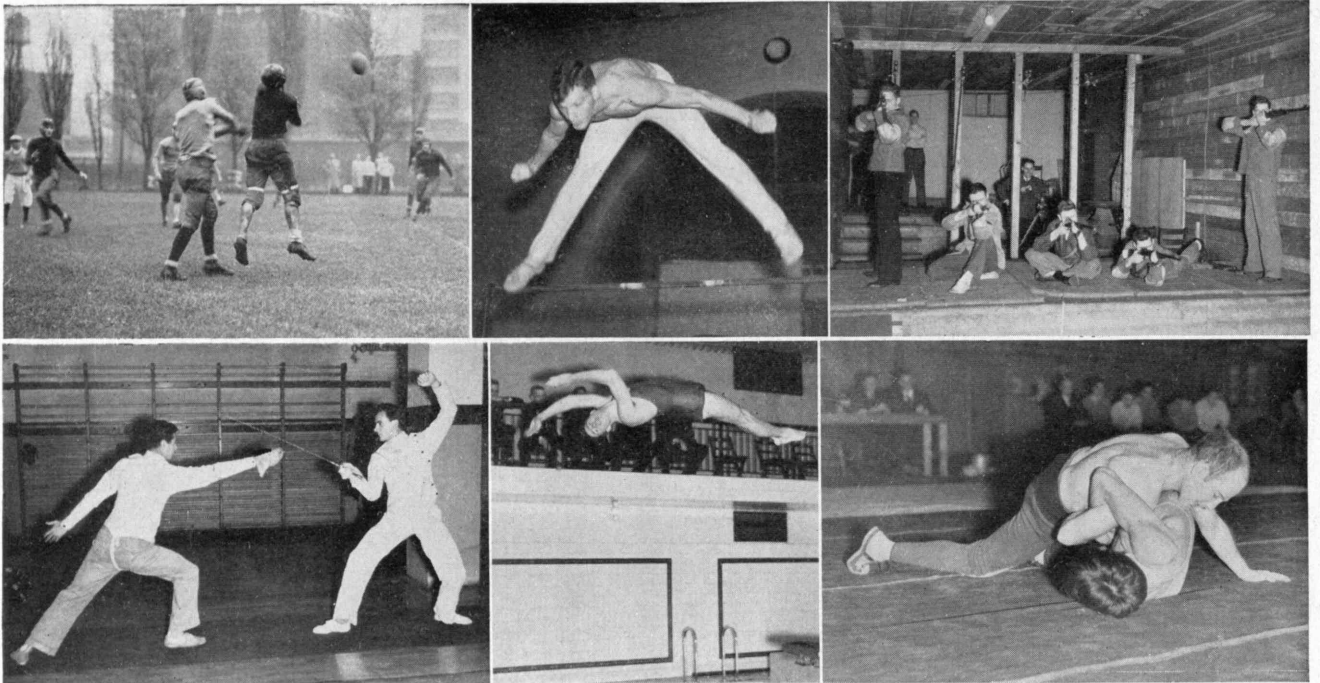


SECOND FLOOR PLAN

PLANS DRAWN BY J. M. PL.

STUDENTS DID THIS

Although design is usually associated with advanced work in architectural education, this attractive house was planned by second-year students in the Institute's School of Architecture. Thus the laboratory method of instruction, so successfully employed in the Schools of Science and Engineering, brings to the young architectural student early in his career many of the realities of professional practice. The house, a Seventeenth Century Colonial dwelling of seven rooms and two baths, is now being built in Wellesley, Mass., under the supervision of students. When completed the house will be sold and the proceeds used to start a similar project for succeeding classes.



Technique

organizations of a local nature in addition to their undergraduate interests at M.I.T. Activities outside the Institute are in some respects most desirable and are a continuation of effort, resulting in leading positions in activities of local importance, which students in fraternities and dormitories are forced to relinquish with residence at the Institute.

The data below were compiled from *Technique* published in the spring of 1935. In the comparison, the figures are based upon the percentage of students actually deserving of mention in the yearbook, not on total enrollment. The data do not include a survey of intramural sports and social activities, nor do they include the large number of students who are engaged in freshman and varsity competition but whose names are omitted from the official tabulation as given in *Technique*.

The Directory of Students for the year 1934-1935 indicates a total enrollment of 2,507: 1,102 or 44% commuters; 453 or 18.1% fraternity men; 420 or 16.8% residents of the undergraduate dormitories; 498 or 19.9% graduate students; and 34 or 1.4% women students.

Of a total of 191 students connected with undergraduate publications (*The Tech*, *The Tech Engineering News*, *Voo Doo*, and *Technique*) 29.3% were commuters, 24.1%, dormitory residents, and 46.6%, fraternity men. Of a total of 237 men listed in *Technique* as engaged in athletics — exclusive of the rifle team — 40.1% were commuters, 19.4%, dormitory residents, and 40.5%, fraternity men.

The commuters were not represented on the varsity crew or varsity squash team. In the following activities, the participation of commuters ranged from 25% to 45%: freshman swimming, 27%; freshman squash, 30%; lacrosse, 25%; freshman crew, 29%; freshman track, 44%; freshman cross-country, 25%; varsity basketball,

27%; varsity soccer, 30%; and varsity wrestling, 36%. In the following activities, participation by commuters exceeded 45%: boxing, 67%; junior varsity crew, 57%; varsity swimming, 50%; varsity 150-pound crew, 50%; varsity cross-country, 56%; varsity hockey, 80%; varsity gym team, 50%; and freshman fencing, 75%. Forty-eight per cent of the rifle team were commuting students. Of a total of 62 men in the Musical Clubs, 43.5% were commuters, 35.5% were dormitory residents, and 21.0%, fraternity men.

As executives and managers, the fraternity group dominated the field. Significant, however is the fact that of the 17 athletic captains, nine were commuters, four were dormitory residents, and four, fraternity men.

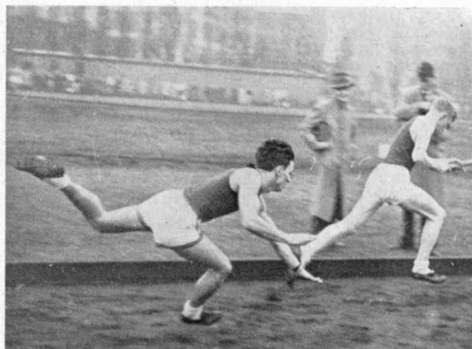
The grand total indicates that of the 517 students listed in *Technique* as officially connected with publications, athletics, and the Musical Clubs, approximately 37% were commuters, 23%, dormitory residents, and 40%, fraternity men. On a basis of total enrollment, exclusive of graduate and women students, the participation in activities is calculated to be in the ratio of one commuter to 2.4 dormitory residents to 4.4 fraternity men.

A Cycle of Cathay—and Other Points Far East

IF Secretary Locke's finger-counting is correct, the Alumni Council convened on October 26 for the 189th time and, if his head count was equally correct, there were 103 members and guests present, which means that the house was two-thirds sold out. The billing which drew such a crowd had as its main item a travel trilogy presented by three members of the Institute staff: Clair E. Turner, '17, who in traveling around the world last year took colored movies (some of which he showed to the Council), lectured no less

IN PROPER SEASON

"... Technology students, as the academic year progresses, may be seen in such athletic poses as those recorded on this and the opposite page. With 16 varsity sports and many more intra-mural ones, Technology athletics, as Fortune remarked last month, are "conducted in the English tradition perhaps more completely than elsewhere in the collegiate United States"



Technique

than 76 times, and studied health education from the hymnal's icy mountains to beyond India's coral strand; Norbert Wiener, who spent a year by invitation of Dr. Yuk Wing Lee, '27, as visiting professor at Tsing Hua University, Peiping, and then continued on around the world; and Dugald C. Jackson, who went to Japan to lecture at the behest of the Electrical Engineering Society of that country and who went to China to play, but lectured there too in response to acclamatory requests. Professor Turner and Professor Emeritus Jackson spoke glowingly of the Japanese and admiringly of the Technology Alumni they met in these far countries. Professor Wiener envisaged a great revival of scholarship in China, and he, too, reported marked loyalty and accomplishment on the part of Institute graduates in the Far East.

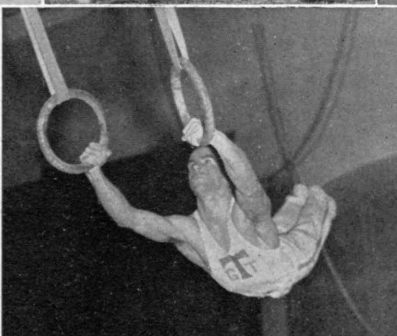
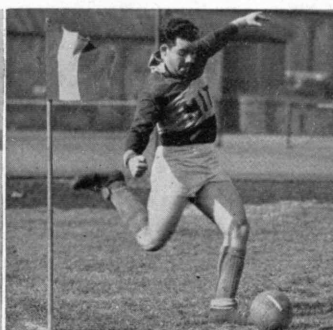
President Compton's impromptu talk was a detailing of the expansion program which was approved by the Corporation last October and described in The Review last month (see also page 72). The Secretary's report was notable for the extraordinary number of visits to Technology clubs he recounted. Out of a list of 27 visits to clubs since last June, five were in California, which prompted a *sotto voce* remark from the floor to the effect that California must be a doubtful state.

The remainder of the program was taken up with introductions of new members of the Council and of recent appointees to the Institute's staff; with reports from the committees on audit and budget, on Alumni Day, 1936, and on the nomination of representatives of local associations; and with the reading of the resolutions on the deaths of Dana P. Bartlett, '86, George L. Gilmore, '90, and Charles W. Aiken, '91, former Council members.

As presiding officer over this lengthy meeting, the first of the academic year and his first as president, Donald G. Robbins, '07, presented the program notes due from a toastmaster with grace, pace, and amplitude. He was warmly welcomed as the Association's new leader.

Augustus Herman Gill, '84 (1864 to 1936)

"AT this moment one circumstance leaves its deep shadows of regret and disappointment in our hearts. It was originally intended that Professor Augustus H. Gill, chairman of the Tyler Portrait Committee, should stand in my place today and make the presentation of this portrait to the Institute. No one else could do it so well as he. For the 56 years since Dr.



Technique

Tyler and Dr. Gill entered the Institute as freshmen, they have been almost constantly associated in educational work either as students or teachers, and have been warm and devoted friends. It was, therefore, specially appropriate that Dr. Gill should have been spokesman today. Unfortunately his illness prevents him from enjoying this deserved honor and high privilege. His remarks would have been, I am sure, inspired with the admiration and regard that a half century of comradeship can well engender." Thus spoke Samuel C. Prescott, '94, at the presentation of the Tyler portrait on Alumni Day last June. The illness which kept Dr. Gill away from this meeting of tribute to Dr. Tyler was destined to bring his death on November 11.

The loyalty and friendship that caused him to work with so much energy and enthusiasm for the painting of Dr. Tyler's portrait were typical of Dr. Gill's relations with his associates at the Institute during the half century of his membership on the staff. His friendships were all the more striking because Dr. Gill was a staunch and militant individualist. He preferred to be, for example, what he called an "expert" rather than a theoretical scientist and despite his extensive training in this country and in Germany he chose the more practical and applied aspects of chemistry for his work.

"For 13 years," as Professor William T. Hall, '95, wrote in *Industrial and Engineering Chemistry*, News Edition, April 10, 1935, "Gill had charge of the purchasing of all supplies for the Departments of Chemistry and Chemical Engineering and his work also included the stopping of all leaks in the building and the equipment of new laboratories. It has been said that under Gill the members of the staff could get better service than at any other place in the world. Even members of the Physics Department had keys for all the rooms where chemicals and apparatus were stored, and no reasonable request was ever denied by Gill or anyone working for him. As a rule, he had supplies on hand for two years' work. It was characteristic of some of us always to prefer unopened bottles of chemicals and at times we forgot to leave orders for the materials we had taken. Gill, however, never lost control of his temper, and in some magic way all the bills were paid. . . .

"Besides teaching large classes, Gill has found considerable time for consulting work and he has served as expert in various patent and legal cases. He has studied and helped determine the cause of many explosions and has testified on the age of ink and of documents."

He held a Ph.D. degree from Leipzig and in 1923 received an honorary Sc.D. from Rhode Island State College. He shall be missed at the Institute, not only because of his tie with the past, but because his rugged individualism, colorful personality, and intense loyalty were cherished by his associates and the institution in the service of which he spent his entire career.

Visiting Committee Reports

EACH year The Review, at the request of the Corporation, presents summaries of the discussions and transactions of the Departmental Visiting Committees, which are playing such an important part in bringing to

our curriculum the advice and experience of Alumni and others prominent in those fields for which our departments train men. Below are condensations of the report of the Visiting Committee of the Department of Modern Languages and of the report of the Visiting Committee of the Department of Architecture.

MODERN LANGUAGES*

THE Committee feels that the best way to interest the students in the acquisition of a new language is to make them realize its advantage to them. They should be brought to a realizing sense that a working knowledge of the language chosen for study is in fact necessary for achieving success in something near to their hearts.

The Committee suggests that the Departments of Chemistry, Architecture, Aeronautical Engineering, and others where a knowledge of one or another foreign language is needed, should require that certain textbooks in the language in question be studied as a part of the regular work of the student in order to provide an incentive for the acquisition of a working knowledge of the language — an incentive which now seems to be lacking in the usual curriculum.

The Committee suggests the advisability of a conference to be held between the Head of the Department of Modern Languages and the heads of other appropriate departments to see if such requirements could not be included in their courses.

There was extended discussion as to the method of acquiring languages, the relative importance of being able to draw information from the printed word or impart information orally, and the Committee gave a good deal of time to the consideration of the acquisition of knowledge of a language for cultural purposes as contrasted with its usefulness merely as an implement of work. The different objects for which a language might be needed mean very different methods of instruction and the degree of devotion to the study of it on the part of the student.

It was ultimately moved by Mr. Barker that the object to be sought in the instruction in modern languages at M.I.T. be expressed as follows: (1) For those students who desire to master a foreign language to an extent that will enable them to make use of its literature in their professional specialty, a prerequisite must be a simple but adequate structural knowledge of the language to be taken at the Institute, unless they have already acquired it in the course of their secondary education; (2) for those students who take up the study of a modern language with the object of obtaining a cultural knowledge of it, that their instruction be given in a manner and to an extent that will give them sufficient command of the spoken word as to enable them to use it as a means of communication.

In this connection it was brought up that the Committee ask the officers of the Department to consider the advisability of providing at least one course in some modern language, Spanish preferred, in which the em-

* The Committee members for 1935-1936 were: W. Cameron Forbes, Chairman, James M. Barker, '07, Ingersoll Bowditch, '00, Donald W. Kitchin, '19, A. F. Whitem, A. Lawrence Lowell, and F. W. C. Lieder.

phasis in instruction is to be put upon its use as a means of communication and in which course the test of passing will be based on the facility shown by the students in communicating their ideas orally.

ARCHITECTURE*

At a meeting held January 8 the Committee discussed the following questions with members of the Departmental staff and the Institute's administration: Is increased teaching of landscape design and construction desirable as part of the curriculum in both architecture and city planning? Is graduate work a desirable development of the facilities of the School in any one of the following fields: (a) landscape design; (b) architectural administration; (c) industrial design?

It was the expressed opinion of the meeting that it would, in the first place, be desirable to place more emphasis in our teaching of architectural design upon the landscape aspects of these problems, rather than to introduce a new course in landscape design; it was further apparent that the feeling was against any present offering of a master's degree in the field of either landscape design or industrial design.

How many opportunities for the use of elective alternatives to the stated curriculum courses in any one of our three regular branches (architecture, architectural engineering, and city planning) be developed to advantage? The Committee recognized that it would be highly desirable to arrange our curriculum so that there might be time in their senior year for students to elect courses of great professional value given by other Institute departments.

The Committee regarded with approval: First, the present state of the laboratory house, the lot for which had been purchased, the plans and specifications for

* The Committee members for 1935-1936 were: Harry J. Carlson, '92, Chairman, Thomas C. Desmond, '09, A. Lawrence Lowell, Charles E. Smith, '00, Edgar I. Williams, '08, Ralph T. Walker, '11, Geoffrey Platt, and Sidney B. Waugh, '27.

which were being prepared by the students, and construction of which will start this fall; second, that research as an integral part of the problems in design in the last two years might be a valuable addition to the teaching in this field, as it is in city planning . . . ; third, a suggestion that a real effort be made to provide opportunities for employment for the scholarship holder who returns to this country after one or more years abroad, as a consequence of which lapse of time there has been a definite severance of his connections with professional opportunities in this country; fourth, the need for finding subjects for research in the field of city planning that might enlist the financial support of business and industry.

Dielectric Progress

PROBLEMS of electrical insulation, including the theory of dielectrics, oxidation in insulating liquids, and insulating materials and practice, were the chief concern of the committee on electrical insulation of the National Research Council's division of engineering and industrial research at its ninth annual meeting which was held at the Institute early in November.

Dean Vannevar Bush, '16, who is chairman of the division of engineering and industrial research, welcomed approximately 100 members of the committee, with Dr. J. B. Whitehead, Dean of Engineering of Johns Hopkins University, presiding as chairman of the technical sessions.

Six of the 26 papers presented were by members of the Institute's staff. The authors were F. G. Keyes, J. L. Oncley, Hans Mueller, A. Baños, Jr., J. G. Trump, '33, whose papers dealt with the theory of dielectrics; J. C. Balsbaugh, '24, R. G. Larsen, D. A. Lyon, and N. A. Milas, who discussed certain aspects of oxidation in insulating liquids. At the committee's annual dinner Professor Ernst A. Hauser discussed recent developments in colloid chemistry.

Statistical Method

Fourth in a Series of M.I.T. Library Reading Lists

COMPILED BY MARGARET PAIGE HAZEN

ARKIN, HERBERT, and R.R. COLTON. *Graphs: how to make and use them.* Harper, 1936.

"A clear and attractive presentation and description of technique. The graphs illustrate data relating to business, education, engineering, and natural sciences." — *American Economic Review*.

BODDINGTON, A.L. *Statistics and their application to commerce.* Seventh edition. Pitman, 1936.

"Prepared to meet the requirements of business men and to promote interest in the maintenance and use of statistical records, so that they may form part of the machinery of scientific management." — *Preface*.

BOWLEY, A.L. *Elements of statistics.* Fifth edition. P. S. King and Son, Ltd., 1926.

Not recently revised, but remains a standard work. Useful for all persons whose business is to handle statistics, or to whom a general

understanding both of the utility of statistical results and the limitations of statistical investigation is important.

BROWN, T.H. *Problems in business statistics.* McGraw-Hill, 1931.

"A series of actual cases indicating certain fundamental problems in statistical methods. Author is associate professor of business statistics at Harvard." — *Book Review Digest*.

BUSH, A.L. *Suggestions for outline of a city survey (industrial and commercial).* United States Bureau of Foreign and Domestic Commerce, 1931. Domestic Commerce Series Number 45.

Included as an example of statistical procedure in a specific field.

CAMP, B.H. *The mathematical part of elementary statistics.* Heath, 1931.

Mathematical rudiments, useful to investigators in widely different fields.

- DAVIS, H.T., and W.F.C. NELSON. Elements of statistics, with applications to economic data. Principia Press, 1935.
"Gives the mathematical requirements of assembling, correlating, and interpreting statistical data." — *Science News Letter*.
- FISHER, R.A. Statistical methods for research workers. Fifth edition. Oliver and Boyd, 1934.
A standard work, with specific application to biological research.
- FRY, T.C. Probability and its engineering uses. Van Nostrand, 1928.
Author is a member of the technical staff of the Bell Telephone Laboratories.
- GREEN, H.W., '16. Real property inventory of the Cleveland Metropolitan District; also his, Movements of families within the Cleveland Metropolitan District, 1934. The author, 1935.
"The stimulus from the Cleveland surveys has already been widely felt, and the accomplishments there in the development of method are reflected in many other community inventories." — *American Statistical Association Journal*.
- HARPER, F.H. Elements of practical statistics. Macmillan, 1930.
"In this volume the greatest emphasis has been placed upon analysis and the exact meaning and true significance of mathematical measurements." — *Preface*.
- KELLEY, T.L. Statistical method. Macmillan, 1923.
One of the standard American texts, written for the growing group of students who are studying mathematical statistics and applying their knowledge in various fields.
- MILLS, F.C. Statistical methods applied to economics and business. Holt, 1924.
The outstanding American text. A new edition is promised for 1937.
- MUDGETT, B.D. Statistical tables and graphs. Houghton Mifflin, 1930.
"A concise, clear, and simple, but scholarly work." — *American Economic Review*.
- PAVER, JOHN. Traffic and trade; an introduction to the analysis of the relationship between the daily habitual movement of people and their trade activities in markets. McGraw-Hill, 1935.
- PEARSON, E.S. Application of statistical methods to industrial standardization and quality control. British Standards Institution, 1935.
"Because of its simple and systematic form, should arouse further interest in the application of statistical methods on the part of manufacturers and others concerned with problems of specification and standardization." — *American Statistical Association Journal*.
- PERSONS, W.M. Forecasting business cycles. Wiley, 1931.
"Dr. Persons believes that the solution of the problem of forecasting business cycles is to be sought in applying the fundamentals of economic theory and logic to adequate statistical and historical method." — *Outlook*.
- RICHARDSON, C.H. Introduction to statistical analysis. Harcourt, Brace, 1934.
"[Presented] in a manner which will enable the beginner to acquire not only a working knowledge of the more simple statistical measures but also an elementary understanding of the reasoning which underlies them." — *American Economic Review*.
- RIGGLEMAN, J.R. Graphic methods for presenting business statistics. Second edition. McGraw-Hill, 1936.
"It is recognized that a definite practice of business charting has been developed which is distinct from engineering charting, though it is closely related to it. It is the object of this book to contribute to the work of standardizing this practice." — *Preface*.
- SHEWHART, W.A. Economic control of quality of manufactured product. Van Nostrand, 1931.
"[An] outstanding contribution . . . towards the closer linking of economics and the engineering sciences." — F. E. Raymond in the *American Economic Review*.
- STEWART, (Mrs.) A.M. and B.M. Statistical procedure of public employment offices; an analysis of practice in various countries and a plan for standard procedure in the United States. Russell Sage Foundation, 1933.
Made for the committee on governmental labor statistics of the American Statistical Association.
- TIPPETT, L.H.C. Methods of statistics; an introduction mainly for workers in the biological sciences. Williams and Norgate, Ltd., 1931.
"[Written] so that a reader with little previous acquaintance may obtain a good working knowledge and understanding of the methods available." — *Preface*.
- UNITED STATES CENTRAL STATISTICAL BOARD. First annual report. Government Printing Office, 1935.
Gives the organization of government statistical services and reviews plans for their development and correlation in the future.
- UNITED STATES FEDERAL EMERGENCY RELIEF ADMINISTRATION. Engineering manual for traffic surveys: a manual covering the method of organizing and conducting each of several important studies of a traffic survey. March, 1934.
- WHITE, PERCIVAL. Marketing research technique. Harper, 1931.
"Written to serve as a manual of instruction for field workers. Covers market analysis, processes of research, personnel of field force, interviewing, and the recording of observations and tabulation of returns." — *American Economic Review*.
- YULE, G.U. An introduction to the theory of statistics. Tenth edition. Griffin, 1932.
"A veritable mine of careful and useful statistical thought." — *American Mathematical Society Bulletin*.

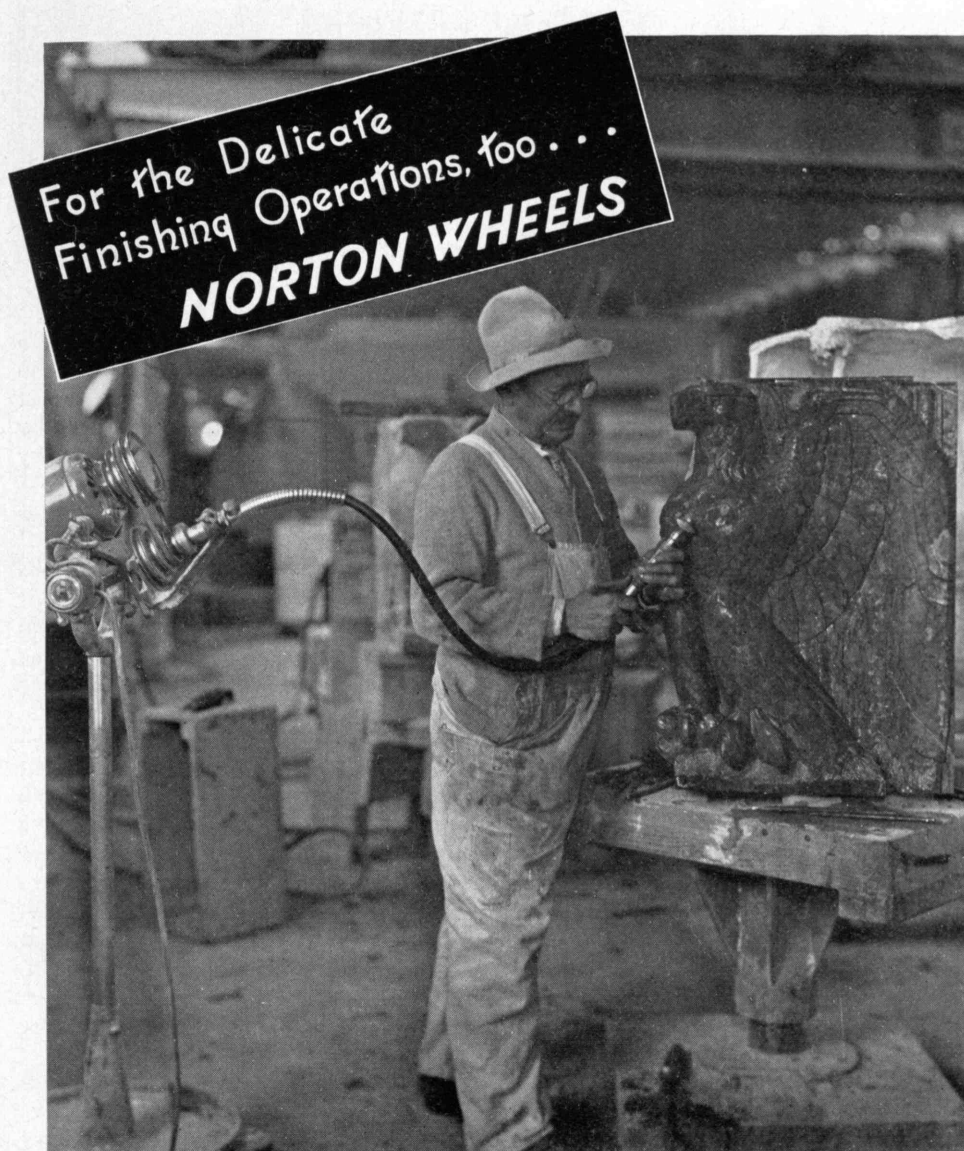
TREND OF AFFAIRS

(Continued from page 64)

officer who had adopted England as his home, wanted the backing of the British Admiralty more than anything else. Brilliant and petulant, he continued his efforts to arouse interest with dogged persistence. Finally he secured permission to tow the Admiralty state barge, loaded with lords, from Somerset House to Limehouse and back. He received no encouragement because the lords of the Admiralty were convinced that a ship driven from the stern could not be steered properly.

Quick to capitalize on Ericsson's failure, Smith took care in his demonstrations to show clearly that his ship could be steered easily. In 1838 the Admiralty notified him his idea would be adopted if he operated satisfactorily on a ship of 200 tons. Smith immediately built the *Archimedes*, an iron-screw three-masted schooner of 237 tons. She was powered with a two-cylinder Rennie engine which drove a screw five feet in diameter and eight feet long, consisting of iron plates fastened to iron arms and keyed to the propeller shaft. This screw was geared to make four-and-a-half revolutions for every revolution of the engine. The ship was a success, but did not come up to her expected speed of 12.6 miles an hour because Smith had not counted on propeller slip. Her best speed was slightly over nine miles. In May, 1839, the *Archimedes* raced His Majesty's ship *Vulcan*, a paddle propelled vessel, and beat her neatly.

Experience gained by tests with the *Archimedes* led to improvements in her propeller, the whole turn being divided into two halves, each five feet, nine inches in diameter and four feet long, placed opposite one another on the shaft. The lesson learned from this change, Mr. Bowen recalls, led to the construction of H.M.S. *Rattler*, the first screw ship of war. Later Smith's screws were reduced, for instead of half, one sixth of a convolution was found to be more efficient. (Concluded on page 91)



Courtesy Kellerflex Dept., Pratt & Whitney Division, Hartford, Conn.

THERE'S a complete line of Norton Wheels for the fussy finishing jobs as well as for the large cutting and molding jobs. Made of hard, sharp, Crystolon abrasive they cut fast and leave a fine finish. For the very smallest portable grinders the wheels are individually mounted on steel spindles. A variety of shapes of wheels makes it possible to do all kinds of finishing jobs quickly and easily.

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NORTON ABRASIVES

AROUND THE CORNER IN AVIATION

(Continued from page 68)

substantially increased. Early trimotors carried only a ton of pay load at half the speed and at about twice the cost per ton-mile.

To facilitate keeping schedules, the cruising speed without head winds is to be maintained with only 60% of the rated power of the engines. Experience has shown that when engine outputs up to 85% of rated power are required to maintain the specified cruising speed in still air, the reserve power is not enough to ensure keeping to schedule on days of ordinary head wind.

To sum up: Tomorrow's Airplane is not a radical departure from the designs of the air transport machines now in service and differs from them chiefly in its greater size and range, the use of four engines instead of two, its smooth exterior and higher speed, and the greater comfort which it affords to its passengers. The improvements are of the nature of refinements. Tomorrow's Airplane is only one of many possible airplanes that could be built in the light of present knowledge. It would be entirely reasonable, for example, to change the design to permit carrying a greater pay load with the same power, but at a lower cruising speed; or one might prefer a greater pay load for a shorter nonstop distance.

THE FUTURE AIRPLANE

With the features and characteristics of Tomorrow's Airplane in mind, it is possible, through analysis of its performance, to anticipate the improvements that should become available within the next five or ten years. Such an analysis shows that the power output at cruising speed of Tomorrow's Airplane is absorbed by the following items:

	Brake Horse Power	Per Cent
Propeller losses	300	14
Wing-induced drag	240	11
Wing-frictional drag	560	26
Landing gear (retracted)	0	0
Fuselage drag	410	19
Tail-surface drag	190	9
Power-plant and cooling drag	460	21
	<hr/> 2,160	<hr/> 100

Examination of each of these items of power loss indicated faint hope of saving in some items but excellent prospects of substantial savings in others.

Propellers. Since present propellers convert 80% to 90% of the engine power into useful work, there is slight prospect of improvement in this feature. Propellers may, in the near future, be made lighter by the use of magnesium or plastics for the blades, but the resulting improvement in airplane performance cannot be very striking. The constant-speed, variable-pitch propeller has evidently come to stay, but we may expect some feathering device to minimize the drag of the propeller of a dead engine. There is nothing in sight to indicate any substitute for the propeller as the immediate mechanism of propulsion of the Future Airplane. Rocket propulsion appears to be without advantages at transportation speeds contemplated today.

Wings. The wing, by moving through the air with a slight inclination, imparts momentum to the mass of air coming within its influence and so receives a reaction whose upward component is lift and whose horizontal component is drag. This induced drag is inevitable from the general mechanics of flight of any heavier-than-air machine. The power expended in maintaining lift (overcoming this induced drag) is some 11% of the total power expended. There is no hope of any substantial reduction in this figure by improved wing forms, although a higher aspect ratio would reduce it slightly.

The frictional drag of the wings, however, absorbs an additional 26% of the power. This drag is of no value in producing lift and is a true parasitic resistance. While it can never be eliminated, it certainly can be reduced by avoiding roughness, by the use of smaller wings, and by flying at higher altitudes.

Further improvement in high-lift devices would allow a reduction of wing area for the given landing speed and, thus, the frictional drag. The trailing edge flaps adopted for Tomorrow's Airplane are a form of high-lift device now proved in service. These give an increase in lift coefficient of some 40% above that of a plain wing and permit a corresponding reduction in wing area without change in landing speed.

There are other high-lift devices, now in the experimental stage, which indicate that further improvement is possible. For example, the use of slots in the wing in connection with trailing flaps can increase the lift 80% beyond that of the plain wing, and certain external or auxiliary airfoils have been shown in the wind tunnel to raise the lift more than 100%. There are practical objections now to the use of these devices, but we may expect that a way will be found to overcome the difficulties.

Aerodynamic theory justifies the expectation that we might save power wasted in wing friction by use of narrower wings of the same span. Such smaller wings will also save structural weight and so, indirectly, save power spent in induced drag. The trailing edge flap may give way to the best of the high-lift devices now in the laboratory stage, by which a net saving of about eight per cent of total power is entirely possible. When wings are loaded to 40 pounds per square foot, the effect of ordinary rough air should be very slight indeed compared with transport airplanes now in service.

There is a less immediate possibility that current research on the mechanics of flow separation may lead to a useful application. It is known that air sticks to or "wets" a surface and that a boundary layer of air forms next to the wing surface. Unless there is a rapid fall of pressure downstream or a sufficient rearward momentum added by the flow of air above, the boundary layer thickens, becomes stationary, and large eddies form. At some critical angle of attack (the angle which the plane of the wing makes to the line of flight), the boundary layer along the top of the wing becomes unstable and the general air flow separates. It no longer follows the upper contour of the wing, and the space between it and the wing surface fills with eddies. The drag is then greatly increased, and we say the wing is stalled. (Continued on page 82)



College of St. Thomas,
St. Paul, Minn.

Key to plot plan: (1) Administration, (2) Armory, (3) Science, (4) Boiler Plant, (5) Arts, (6) Chapel, (7) Ireland Hall, (8) Infirmary.

COLLEGE OF ST. THOMAS GETS IMPROVED HEATING

Webster Moderator System Gives
Catholic College Dependable
Central Heating Control

SAVES \$1,600 ANNUALLY

St. Paul, Minn.—The cost of heating eight buildings on the campus of College of St. Thomas has been reduced as much as \$466.75 in a single month, as the result of a Webster Heating Modernization Program completed in December, 1934.

Costly and cumbersome "cruising" of the campus to adjust manual heat controls has been eliminated. Each building has its own operating schedule but steam distribution is controlled from a central point. The basic rate of steam delivery is regulated by an automatic Outdoor Thermostat.

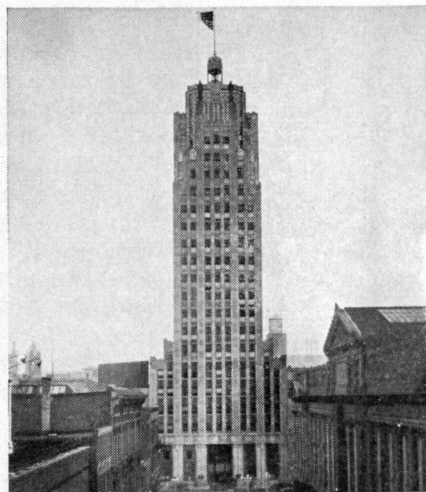
Webster Central Heating Control allows the college authorities to revise the general heating schedule, as classroom schedules are made up, thereby taking full advantage of the economy gained by shutting off steam whenever a building or zone is unoccupied.

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The installation at College of St. Thomas was made by J. McClure Kelly, Minneapolis heating contractors. There is a total of 36,651 square feet of installed direct radiation.

The Rev. J. H. Foran, Business Manager of the College, expresses satisfaction with the performance of the Webster Moderator System.

Other college buildings heated by Webster Moderator Control include such installations as the central heating system for 22 buildings at Mount Holyoke College, and five buildings of the University of Minnesota.



Lincoln Bank Tower, Fort Wayne, Ind.

CENTRAL HEAT CONTROL CUTS COAL CONSUMPTION

Webster Moderator System Saves
\$781 in Lincoln Bank Tower
During '35-'36 Season

Uses "Control-by-the-Weather"

Fort Wayne, Ind.—The Lincoln Bank Tower, equipped when built in 1930 with a modern vacuum system of steam heating, was further improved during the summer of 1935 with a Webster pneumatic-type Moderator System of Central Heating Control.

This improved system reduced coal consumption 150 tons during the 1935-36 heating season, equivalent to a cash saving of \$781.50.

During 1935-36, with the Webster Moderator System, the cost of heating the Lincoln Bank Tower was \$2,349.71. The old system for a comparable number of degree days would have required a fuel expenditure of \$3,131.21.

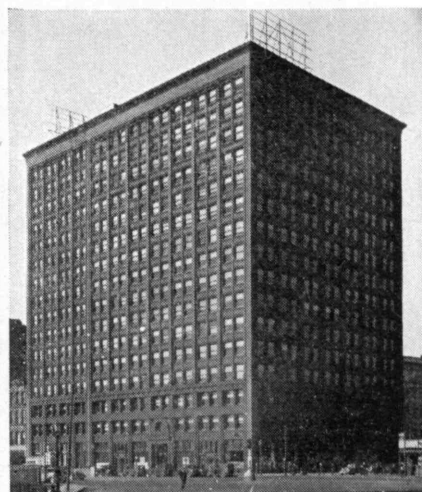
The effectiveness of the Webster Control is indicated in the following summary:

	Lbs. Coal Fired	Degree Days	Lbs. Coal Per D.D.
1934-35—Before Webster Control..	1,073,520	6,046	177
1935-36—After Webster Control..	902,000	6,792	132

Investigation of comparable buildings led the management of the Lincoln Tower to the conclusion that addition of Webster "Control-by-the-Weather," with accurately sized metering orifices and convenient manual supply valves, would afford increased flexibility and at the same time effect a modest saving.

The results of the first season's operation show the objectives fully achieved. Comfort has been increased and wasteful window opening reduced to a minimum.

Schwegman-Witte Co., of Fort Wayne, acted as heating contractors. The architects of the building, when it was constructed, were Walker and Weeks of Cleveland and A. M. Strauss of Fort Wayne.



Rockefeller Building, Cleveland, O.

ROCKEFELLER BUILDING GETS MODERN HEATING

Application of Webster Moderator
Control to One-Pipe System
Cuts Modernization Cost

REDUCES STEAM CONSUMPTION

Cleveland, O.—How a one-pipe heating system can be modernized with metering orifices and effective central control has been demonstrated in Cleveland where the 16-story Rockefeller Building and four adjacent smaller buildings, managed by the T. W. Grogan Company of Cleveland, are getting improved heating service at lower cost as the result of a Webster Heating Modernization Program completed in 1934.

Modernization of the Rockefeller Building group and the application of Webster Moderator Control, a project requiring about two months, was accomplished without expensive revision in the piping. The one-pipe air line system was retained, balanced heating being assured by the accurate orificing of supply mains and radiators.

An Automatic Outdoor Thermostat regulates a single central main steam control valve. Modification of the steam supply and operation in accordance with a definite schedule, is provided by a manual Variator in the engineer's office.

As a result of the modernization, the Rockefeller Building is securing balanced heating service at minimum cost.

The modernization program included a change to use of purchased steam and power in place of a generating plant. Approximately 5,000 square feet of basement space was made available by the removal of boilers, engines and generators.

Walter Klie, president of the Smith & Oby Company, prominent modernization heating contractors who made the installation, points out that Webster Moderator Control has given the Rockefeller Building group the assurance of permanently reduced heating cost without a large capital expenditure.

If you are interested in heating new buildings, or in improved heating service and lower heating cost in your present building, address

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AROUND THE CORNER IN AVIATION

(Continued from page 80)

Experiments have shown that such stalling can be prevented or delayed to larger angles of attack by sucking the boundary layer into the interior of the wing. Slots cut in the upper surface are in communication with a blower. The boundary layer is prevented from thickening, and separation and eddy formation do not start. A very high lift coefficient has been obtained in this manner, but considerable power has to be expended by the blower, the construction is complicated, and the high lift is obtained at an undesirably high angle of attack. It is also possible to obtain increased lift, without change of angle, by blowing air out from suitable slots instead of sucking it in, and in this way keeping the boundary layer moving and hence stable. We may agree that schemes of boundary layer control are impractical today, but the principle is there, and some one somewhere may solve the difficulties. The development of boundary layer control, even in the laboratory, has not yet reached a stage at which it would be justifiable to assume its use even in the Future Airplane.

Fuselage and Tail. The fuselage drag is only five per cent more than that of the best airship form of the same size. Likewise, the tail unit as designed is already as smooth and thin as seems practicable. It was assumed that both tail and wing surfaces would be perfectly faired into the body so as to create no added resistance from interference with the air flow. The Future Airplane can hardly expect to save much power on these items.

Structure. If the structure of the airplane itself could be built lighter, the gross weight for the given pay load would be less. This would permit smaller wings and tail and a saving in power. There is reason to believe, however, that only very slight savings in structural weight can be obtained by refinement of existing methods of construction. As speeds increase, the demand for greater strength and rigidity implies greater weight rather than less.

There is no relative weight saving to be expected from larger airplanes so long as landing and take-off conditions remain fixed. Likewise, an evident trend toward more generous passenger facilities and more rugged details of construction works away from lighter construction. Important saving in structural weight appears to await the availability of new materials of construction. Plastics reinforced with high-strength vegetable fibers indicate a possibly more favorable strength-weight ratio. Magnesium alloys are light and, some day, may be safe to use. There is the more remote possibility of the use of beryllium. New structural materials, however, are not yet in sight. There is no trend toward a lighter structure for the Future Airplane.

Engine Form and Location. The presence of an engine of whatever size or shape in front of a wing necessarily adds something to the drag. For maximum propeller efficiency in an airplane of this size, it is necessary to have the propellers five feet ahead of the wing. A structure of some kind is then required for the support of the propeller. Serious study was given to placing the engines entirely inside the wing, but this position has a very disturbing effect on balance. One method of cor-

rection is to give the wing a considerable degree of sweepback, so that its plan form takes the shape of an arrowhead. Such a form is structurally undesirable. Another alternative is to move a considerable part of the useful load forward, but this adds to the total length of the fuselage and increases weight and drag. In an airplane of the type under discussion, it was concluded that the disadvantages of placing the engines within the wing are greater than the advantages. In much larger airplanes of the future, the engines might be located inside the wing and perhaps pusher propellers used. The best solution in sight, however, is to use the engine itself as the propeller support, keeping its frontal area as small as possible. This compromise, eliminating the consideration of cooling for the moment, adds very little, if any, drag to that caused by the necessary propeller support alone. The Future Airplane is likely to have very compact engines of somewhat greater length.

Cooling. The power absorbed in cooling the engines has been found in practice to be about the same whether obtained by direct air cooling with low-drag cowlings or by high-temperature liquid cooling with conventional semi-inclosed radiators. The advantage has been with the air-cooled engine because of the saving in cooling-system weight which could be turned into pay load — no inconsiderable item, in this case amounting to approximately 1,200 pounds. The ideal cooling arrangement would utilize the wing surfaces, thus adding nothing directly to the drag of the wing. The extra weight of such a system is, however, a handicap, and separate provision would probably have to be made for cooling at take-off when there is little air flow over the wing, except directly behind the propellers.

Another promising improvement in engine cooling is the use of an engine-driven blower to force air around the cylinders. Such a system permits placing the engine in a smooth-type cowl with air inlet and outlet openings so placed as not to impair the aerodynamic characteristics of the wing. The present air-cooled engines are light but wasteful aerodynamically, in that the engine with its cowl interferes with the smooth air flow over the wing, and the power required to pass an adequate supply of cooling air under the cowl is greater than strictly necessary to cool the cylinders.

By combining the possible gains from reduced frontal area of engines and from wing-surface cooling, it appears feasible to reduce the power-plant drag by enough to effect a saving of more than 15% in the total drag of the airplane. This is a powerful incentive to designers, and we feel safe in predicting that liquid cooling and skin radiators (with possible retractile booster radiators of conventional type for take-off) will be used just as soon as such a system can be made sufficiently dependable. A blower cooling system may come into use on the Future Airplane.

Fuel Consumption. A few years ago a specific fuel consumption of .55 pounds per horse-power hour was usual and acceptable. In 1935 one of .46 pounds was considered very good. Today Pan American Airways is averaging .44 pounds on its transpacific flights and experimental engines are running on .41 pounds or less. The maximum of thermodynamic efficiency for the present compression ratios of 6.5:1 or 7:1 has practically

been reached; further gains in this respect will be achieved largely by the use of higher compression which, in turn, requires fuels of higher octane rating, that is, with less tendency to detonation. For present engines, a specific fuel consumption of .44 pounds per horse-power hour at cruising speed is assured for 87 octane fuel and materially lower consumption with improved fuel is likely to be achieved in commercial operation in the next few years. The amount of supercharging employed is intimately connected with the specific consumption, as the fuel required to drive the supercharger naturally must be added to that consumed in driving the airplane.

Fuel consumptions below .42 pounds, although obtained on bench tests, are, at this time, lower than can be maintained in service where questions of cooling, spark-plug life, and exhaust-valve durability must be considered. A lowering of specific fuel consumption has adverse effects on the temperature of the engine and on the life of these parts.

Diesel. From time to time the Diesel engine has been advocated for aircraft because of its low fuel consumption and reduced fire hazard. Heavy, slow-speed, stationary Diesels have been operated with a fuel consumption as low as .35 pounds per horse-power hour; the higher speed and lighter engines used in the *Hindenburg* are reported to have a specific consumption of .40 pounds.

Against this saving of 10% over the fuel consumption obtainable by the best gasoline practice today must be charged some 45% added weight of the Diesel over the equivalent gasoline-engine weight. Unless the flights contemplated are longer than required to cross any but the widest continents or oceans nonstop, this added engine weight cannot be offset by fuel saving.

The engines of the Future Airplane may run on some volatile fuel produced by chemical engineering, which we would today hardly designate as gasoline, but we believe the engines will be essentially of the electric ignition type rather than Diesel. The trend toward reduced fuel consumption of the present gasoline engine indicates that at least a 10% reduction in specific fuel consumption can be expected in the near future. The Diesel must be made even more economical as well as lighter if it is to possess any advantage in efficiency. Improved fuel for the gasoline engine may also permit a higher take-off rating for the engines, which, in turn, allows a further increase in pay load to be taken into the air.

(Continued on page 84)

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AROUND THE CORNER IN AVIATION

(Continued from page 83)

We conclude that the Future Airplane may very well have smaller wings with an improved high-lift device, small diameter engines with wing radiators or blower cooling, and should then make the same speed with about 30% less power. On this basis the operating costs would be reduced five cents per ton-mile as compared with Tomorrow's Airplane, under the same conditions.

A design study for the Future Airplane was made to reduce these considerations to concrete form. A comparison with Tomorrow's Airplane follows:

TABLE III

	<i>Tomorrow's Airplane</i>	<i>Future Airplane</i>
Cruising altitude, feet	10,000	10,000
Gross weight, pounds	39,280	33,000
Useful load, pounds	12,260	9,860
<i>Crew</i>	760	760
<i>Fuel and oil</i>	6,400	4,000
<i>Passengers</i>	3,400	3,400
<i>Baggage</i>	700	700
<i>Cargo</i>	1,000	1,000
Cruising power	2,160	1,500
Cruising speed, miles per hour	225	225
Rated power	3,600	3,000
Per cent of rated power required for cruising	60	50
Range, miles	1,250	1,250
Direct operating cost, cents per ton- mile of pay load	23	18

At some time in the near future, a designer able to take advantage of trends in the art now evident to us, could design this smaller and more economical airplane to meet present commercial requirements. The Future Airplane to carry the specified pay load at 225 miles per hour would be nearly 6,000 pounds lighter and require some 600 less rated engine power than Tomorrow's Airplane.

The lowered costs of operation come largely from lower gross weight and power, resulting in a saving in depreciation and insurance charges as well as in fuel consumed. Passenger comfort will be enhanced by the higher wing loading (perhaps 40 pounds per square foot) and by greater quiet due to the leisurely way the engines may be run.

OTHER DEVELOPMENTS

The changes in design from Tomorrow's Airplane to the Future Airplane that have just been discussed are by no means all that can be envisaged. Within rather wide limits airplane size is limited only by cost and by density of traffic, for travelers by air demand frequent schedules. Airplane speeds could be greatly increased merely by providing engines of greater power, but that would involve sacrifices in pay load or in range. The questions of the best size of airplane and the speed at which it should be designed to cruise are, therefore, basically economic rather than engineering in their nature, and the answers to them will vary in accord with competitive conditions prevailing on the line over which the airplane is to be flown. (Continued on page 86)

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AROUND THE CORNER IN AVIATION

(Continued from page 84)

The operation of the airplane at a considerable altitude, where the air density is low and storms are absent, offers the possibility of improved performance without some of the disadvantages just mentioned, and consideration has, therefore, been given to the high-altitude airplane. In examining this problem, meteorological conditions aloft were first investigated. The data, by no means as extensive as could be desired, indicate that, in our latitude, westerly winds of increasing velocity are encountered from the ground to the stratosphere. An altitude of 25,000 feet appears to be above all storms, but it is indicated by the records that on west-bound trips head winds would be encountered there 78% of the time, approaching velocities of 50 miles an hour, and that not all the east-bound trips would have a favoring wind. The average head wind west bound would just about offset the possible saving in power due to the reduced density, so that higher ground speeds would be feasible only on a portion of the east-bound trips. It seems impractical to operate an airplane at an altitude of more than 25,000 feet in transcontinental service with as many as two intermediate stops, for the time spent in climbing to and descending from the operating altitude would preclude much of the journey being actually made at that altitude.

With operation at 25,000 feet, it was apparent that only the time for the east-bound trips could be reduced. This reduction, however, would at least compensate for the differences in local time, so that the hours of arrival and departure could be identical for east-bound and west-bound trips, instead of being different as in usual operations across time zones. On the other hand, improved regularity of service could be expected due to the avoidance of storms, and greater passenger comfort would be insured due to the smoother air. As it is possible that these advantages are sufficient to justify the increased cost of the equipment, a study was made of an airplane suitable for such service.

High-altitude Airplane. To make the Future Airplane suitable for operation at 25,000 feet, the engines must have much greater supercharging than for operation at 10,000 feet, and the cabin must be supercharged to correspond to about 10,000 feet, this being the altitude to



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which the average passenger can comfortably be carried without additional oxygen. By drawing engine air through the cabin, the cabin supercharging can readily be provided since the oxygen consumed by its occupants is very small compared to that required by the engines. Since the pilots' cab must also be supercharged, the openings for many controls and instrument leads have to be sealed.

These considerations will tend to handicap the high-altitude version of the Future Airplane, but some gains are still to be had. Table IV shows the comparative effects of supercharging for both Tomorrow's and the Future Airplanes. In spite of the increases in weight there remains a saving in power required for cruising. The basis for the estimates assumed that the high-altitude airplanes are still well suited for operation at 10,000 feet. This provision has been made to care for those trips where strong adverse winds at altitude would offset the advantage of reduced power required. If the low-altitude requirement did not need to be met, there would be some additional gain, but in view of the wind velocities at altitude it appears unwise to allow a reduction in performance at 10,000 feet.

TABLE IV
Tomorrow's
Airplane

Future
Airplane

	(Supercharged)		(Supercharged)	
Cruising altitude, feet	10,000	25,000	10,000	25,000
Gross weight, pounds	39,280	42,000	33,000	35,000
Useful load, pounds	12,260	12,260	9,860	9,860
Crew	760	760	760	760
Fuel and oil ³	6,400	6,400	4,000	4,000
Passengers	3,400	3,400	3,400	3,400
Baggage	700	700	700	700
Cargo	1,000	1,000	1,000	1,000
Cruising speed, miles per hour	225	225	225	225
Rated power	3,600	3,600	3,000	3,000
Per cent of rated power required for cruising	60	48	50	42
Range, miles	1,250	1,250	1,250	1,250

³ The fuel carried at 25,000 feet is the same as at 10,000 feet so that, if necessary, the 25,000-foot airplane can make its run at 10,000 feet.

It seems probable that high-altitude operation will be of more value in transoceanic service where the distance is ample to take advantage of power saving and where weather conditions and passenger comfort are prime considerations.

The general idea of very high altitude flying is attractive for any long nonstop flight. A nonstop flight across the continent might be made east-bound at 40,000 feet, where westerly gales are of maximum strength, and west-bound at 60,000 feet, where gentle easterly winds or none at all may be expected. However, for such a 3,000-mile flight the pay load will nearly vanish because of the great weight of equipment required. The operating costs seem, today, to be prohibitive even though the serious engineering problems were solved.

We, therefore, do not believe that the stratosphere as an avenue of transcontinental air traffic can be opened up during the life of Tomorrow's Airplane in such a way as to destroy its commercial usefulness. For the more distant future, however, especially in lower latitudes where westerly winds do not (Concluded on page 88)

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AROUND THE CORNER IN AVIATION

(Concluded from page 87)

prevail and for long-range operations, there are fascinating possibilities inherent in the fact that our atmosphere grows thin aloft.

CONCLUSIONS

The results of this effort to look around the corner are, perhaps, limited by the fact that we do not have a clear view. What we expect to find can be only a projection of our own ideas. We now know of aerodynamic principles and devices not yet applied in practice, we have seen engine designs and fuels which have not yet been tested, and we know what the metallurgists are trying to accomplish. We also know that in every industrialized country of the world research laboratories are working on all of the problems of flight. Improved safety and efficiency must surely result in the course of time.

The limitations on any very optimistic prediction arise from the assurance that gravity, the weather, and human physiology will always be with us unchanged. A further limitation, of course, comes from our human fallibility, in that we cannot conceive of new principles and inventions not yet discovered.

Within these limitations, it seems to us reasonable to believe that progress will take place along the lines indicated as promising by current research. The greatest value of research is to disclose where gains may reasonably be expected and to cause a concentration of effort on certain problems. Tomorrow's Airplane should gain 50 miles speed over today's best and afford more passenger space without increase in cost. The Future Airplane, making use of improved high-lift devices and smaller engines with less cooling drag, should further increase passenger comfort, due to heavily loaded wings, and decrease operating costs, due to savings both in power and size for the same duty.

It further appears from our study that we need fear no radical change in the basis of airplane design sufficient to make prematurely obsolete the best transport airplane (like Tomorrow's Airplane) which could be built today. This gives some assurance of economic stability to the new capital now going into the aircraft industry. It should also be of interest to the owners of this new capital to realize that future progress will inevitably permit lower operating costs and, hence, a more favorable competitive position with regard to slower, and at present cheaper, surface transportation.

We must not fail to realize, finally, that there are social and political implications in the potential availability of a common carrier to go from any town in the North American continent to any other town on the continent overnight and to bring Europe within 24 hours of our shores.

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TOWARD A LIBERAL EDUCATION

(Continued from page 71)

With this awareness at the outset, a student will contrive, somehow or other, at college or later on, to acquire the rudiments of a liberal education. At college the most direct way for him to approach this end is by means of courses in the humanities.

The humanities are traditionally defined as dealing with man's activities—intellectual, emotional and artistic, economical, political, and social. They are by definition liberal and humanistic. As is the case in every other field of study, there are at the colleges informative humanistic courses which are primarily of the nature of training prerequisite to advanced interpretative humanistic courses which are educational and cultural. Thus, an acquaintance with the facts of history must precede their interpretation, an acquaintance with the phenomena of economics must precede an understanding of economic history, with the phenomena of civilization an evaluation of the effect of scientific discovery upon the progress of culture. In short, since we are speaking of a liberal education or an education in man's activities, we may at once exclude from further discussion in the present paper those studies which produce an acquaintance with man's activities, the necessary place of such studies in the educational program being taken as sufficiently clear, and devote the rest of the argument to those studies which tend to develop an ability to eval-

uate them. And let us agree without further debate that informative courses necessarily contain much of educational value, that training and education cannot be dissociated wholly from one another, but that advanced courses are possible which are primarily of educational intent. It isn't merely a knowledge of man's activities but a knowledge of the value and consequences of the activities which is the property of a liberally educated man.

Man's activities may conveniently be classified in four categories, as follows:

1. What man knows and thinks (man's intellectual life),

2. What man does (man's active life),

3. What man feels (man's affective life), and

4. How man behaves in the group (man's social life).

Conventionally the first of these corresponds to philosophy, the second to history, the third to literature and the fine arts, and the fourth to sociology and the study of human institutions. But the conventional content of the humanities was determined in the late Middle Ages by scholars who were weary of the long-established dictum of the church that the only worthy objects of study were theology and divine revelation. They wished to study openly and to praise the works of man, no longer to be furtive and apologetic in their admiration for the things to which the intellect of the ancient and pagan world had been wholesomely and almost wholly devoted. The ancients found it needless — as *(Continued on page 90)*

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TOWARD A LIBERAL EDUCATION

(Continued from page 89)

we ought truly to find it needless — to distinguish the humanities from the other departments of knowledge. Our science, after all, is human science; our religion, man's emotional reaction to the order of things. The distinction of the humanities arose at a time when science was in a state of total anesthesia administered and maintained by the church. Since that time many changes have occurred, most important among them perhaps the rediscovery and general recognition of the truth that experience is the only authentic source of knowledge. Science has increased enormously. It has resumed the position which it occupied in the minds of the ancients and has advanced beyond their furthest dreams. Religion is now one of the humanities, to be studied along with the other hopes and aspirations of mankind. If we accept the traditional definition of the humanities, it is decidedly necessary to check it for content, to determine specifically what subjects of study, or fields of interest, now lie within its scope.

Dr. George Sarton describes his purpose in the introductory chapter of his great work on the history of science:

"The purpose of this work is to explain briefly, yet as completely as possible, the development of one essential phase of human civilization which has not yet received sufficient attention — the development of science, that is of *systematized positive knowledge*. I am not prepared to say that this development is more important than any other aspect of intellectual progress, for example, than the development of religion, of art, or of social justice. But it is equally important; and no history of civilization can be tolerably complete which does not give considerable space to the explanation of scientific progress. If we had any doubts about this, it would suffice to ask ourselves what constitutes the essential difference between our and earlier civilizations. Throughout the course of history, in every period, and in almost every country, we find a small number of saints, of great artists, of men of science. The saints of today are not necessarily more saintly than those of a thousand years ago; our artists are not necessarily greater than those of early Greece; they are more likely to be inferior; and of course, our men of science are not necessarily more intelligent than those of old; yet one thing is certain, their knowledge is at once more extensive and more accurate. *The acquisition and systematization of positive knowledge is the only human activity which is truly cumulative and progressive.* Our civilization is essentially different from earlier ones, because our knowledge of the world and of ourselves is deeper, more precise, and more certain, because we have gradually learned to disentangle the forces of nature, and because we have contrived, by strict obedience to their laws, to capture them and to divert them to the gratification of our own needs.

"My work contains but very few references to political or to economic history. This does not mean that I underestimate political and economic factors. On the contrary, I clearly recognize that these factors are very often not only important, but decisive. If we had to write the biography of a great man, we would not lay too much stress upon the diseases from which he suffered in the course of his life; yet we would be mindful of the fact that those diseases which interrupted and maybe thwarted his activity might have stopped it altogether, in which case there would have been, perhaps, no biography to write. We are not interested

in the pathological history of mankind (at any rate, not for its own sake); we believe that men were born not to fight, but to love and help one another; yet we must remember that wars and other calamities do happen, and that they often interfere with the accomplishment of mankind's essential task."²

The essential task of *homo sapiens* — to be sapient — is to develop in himself that quality by which alone he differs from all other animals. A study of the development of man's understanding and insight, a study of man the knower and thinker, is perhaps the most humanistic of all studies. A course in this subject, perhaps more than any other single course, will hasten for the student the process of acquiring a liberal education.

If now we specify the most important of the subjects which lie within the four subdivisions of the humanities, we have:

1. Corresponding to man's intellectual life, the history of science and thought, the history of all positive knowledge of whatever kind and of all thought about this knowledge or based upon it,
2. Corresponding to man's active life, the history of civilization, political history, the history of engineering, technology, invention, manufacture, the useful arts, trade, travel, exploration, and so on,
3. Corresponding to man's affective life, literature and the fine arts, music, ethics, esthetics, religion, speculative metaphysics, and so on, and
4. Corresponding to man's social life, sociology, cultural anthropology, human institutions, politics, government, banking, the church, the law, and so on.

The third of these groups will be recognized as the stronghold of the old humanities. The liberally educated person ought, however, in ideal at least, to have an insight into the matters included in all four categories. But art is long, as Hippocrates wrote, life is short, and time is fleeting — and no student can possibly take courses in all of these subjects.

All of the subjects mentioned above, and the others unnamed which ought to be included if the list were to be complete, are capable of being studied for the reason precisely that we have positive knowledge about them. We have positive and more or less systematized knowledge of inanimate nature, of animate nature, of man, of man's intellectual life, of man's active life, of man's affective life, and of man's social life. An account of the advancement of knowledge in all of these directions must be included in a complete discussion of the history of science. It is included in Sarton's book which demonstrates fully that the feat is not impossible.

An adequate account of the history of science will be an account of the process by which man has accumulated his positive knowledge. It will include a considerable portion of the history of philosophy and something of comparative religion, for science and philosophy interact with one another — and no account of man's acquiring of his knowledge can be complete without an account of his insights and evaluations. It will necessarily make mention of the conditions of living which prevailed at different times and places, of the materials in common use, of the political environment, of war and

² George Sarton, "Introduction to the History of Science" published for the Carnegie Institution of Washington by the Williams & Wilkins Company, Baltimore, 1927, I, 3-4.

peace, of the contemporary useful arts, of travel, and the discovery and exploitation of new lands, for all of these are factors in supplying facilities and motives for observation and experiment. The simultaneity of great scientific activity and political corruption, the relation of Lavoisier's experimentation and doctrine to the earlier philosophy of Locke, the failure of the Mohammedans to give a religion to Latin Europe and their success in the giving of science, the effect of the applications of science in producing more science to be further applied — these are typical of the points which will be brought out. Some discussion of the method of science will be included, of the mental process by which information is converted into knowledge, of the nature of hypothesis, of belief, and of proof. The contributions of the great civilizations of the past will be discussed and compared. . . . But we are not now writing a prospectus for a course in the history of science. The point is that such a course is truly a general course in the humanities. It supplies the best single basis for a liberal education or for later specialization in any of the fields of humanistic study. Clearly, too, an excellent foundation for it is in rigorous courses in the fundamental sciences.

TREND OF AFFAIRS

(Concluded from page 78)

Ericsson, meantime, had secured the support of Captain Robert S. Stockton, an American naval officer then visiting in London, and built an iron vessel which was named for his patron. She was fitted with two of Ericsson's screws and operated satisfactorily. Later, risking Ericsson's hot temper, Smith, who had shown a friendly interest in their competition, suggested that one wheel would operate better than two. To Ericsson's credit he accepted the suggestion, removed one wheel, and found a marked improvement. About that time Ericsson became disgusted with his treatment and emigrated to America, taking with him the *Robert S. Stockton*, which later became a towboat on the Delaware River. In this country the steam sloop *Princeton* was built to take Ericsson's engines and screws. Later the French 44-gun frigate *Pomone* was equipped with his propelling machinery, and finally, in 1844, the inventor secured the support of the British Admiralty and his inventions were incorporated with great success in the British frigate *Amphion*.



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An employment survey of the Class of 1936 shows that 92 per cent of those awarded degrees last June are now satisfactorily employed or carrying on graduate work. On December 1, 1935 the corresponding figure for the Class of 1935 was 84 per cent. The details of this last survey are tabulated below.

EMPLOYMENT SURVEY	<i>Awarded Doctors' Degrees in Science or Philosophy</i>		<i>Awarded Masters' Degrees in Science or Architecture</i>		<i>Awarded Bachelors' Degrees in Science or Architecture</i>		ALL GROUPS	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1936 June Graduates								
Employed	41	100	106	95.5	286	76.0	433	82.0
Engaged in Advance Study . . .	0	..	3	2.7	50	13.3	53	10.0
Status Unknown	0	..	1	0.9	3	0.8	4	0.8
Unemployed	0	..	1	0.9	37	9.9	37	7.2
TOTALS	41	100	111	100.	376	100.	528	100.

In view of the small number of recent graduates still available for employment, employers are urged to inform the Placement Bureau of their probable demand for 1937 graduates as early as practicable.

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CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

Cleveland Congress

¶ The National Metal Congress, meeting in Cleveland, Ohio, October 19 to 23, was a joint session of the American Society for Metals, American Institute of Mining and Metallurgical Engineers, Wire Association, American Welding Society, and American Society of Mechanical Engineers. In such a gathering it might be expected that M.I.T. would be well represented. It was; witness the following list: "Metallurgical Reminiscences," delivered at the dinner of the metals divisions, October 21, by ALBERT SAUVEUR '89; "Laws and Fundamentals of Plastic Deformation," by A. V. DEFOREST '11, who was vice-chairman of a round table discussion of physical tests and their significance; "During Quenching," by I. N. ZAVARINE '20; "Some Effects of Small Additions of Vanadium to Eutectoid Steel," by R. H. ABORN '20, co-author with J. G. Zimmerman and E. C. Bain; "Basic Open-hearth Slag Control," by EARNSHAW COOK '22; "Effect of Titanium on the Hardness and Microstructure of Heat-treated 18% Chromium Steel Ingots," by R. E. BANNON '30; "Poisson's Ratio," by ROBERT W. VOSE '31; "Aging Phenomena in Silver-Copper Alloys," by MORRIS COHEN '33; "Slip, Twinning and Cleavage in Iron and Silicon Ferrite," by G. ANSEL '34, co-author with C. S. Barrett, and R. F. Mehl.

R. H. SWEETSER '92 was chairman of the blast furnaces and raw materials committee; W. M. CORSE '99, Treasurer of the Institute of Metals Division, was committee chairman for the annual lecture; A. V. DEFOREST '11, chairman of the non-destructive testing committee; A. B. KINZEL '21, chairman of the mining and metallurgy committee and of the round table discussion of physical tests and their significance; and G. B. WATERHOUSE, Staff, chairman of the manufacture of wrought iron and the manufacture of Bessemer steel committees.

We Applaud

¶ CHARLES CAMSELL '09, who is Canadian deputy minister of mines as well as chairman of the Dominion fuel board, on becoming the deputy

minister of the entire new Canadian department of mines and natural resources since the departments of interior, mines, immigration, and Indian affairs were reorganized under this head, effective December 1.

¶ EMANUEL B. HERSHBERG '29, on receiving the Lilly Research Fellowship in chemistry at Harvard University.

¶ ELIHU THOMSON, Staff, on the 50th anniversary of his development of electrical resistance welding. On October 16 the Detroit section of the American Welding Society honored him of whom Dr. Compton once said: "More than any man now living or, in fact, more than any man in history, Elihu Thomson combined the constructive powers of the inventor, the thoroughness and soundness of the man of science, and the kindly balance of the ideal philosopher, teacher, and friend."

¶ KARL T. COMPTON, President, on being presented with an honorary degree from Williams College at the Mark Hopkins Centenary celebration, October 12.

Written

¶ By HERBERT EISENHART '07, President, Bausch and Lomb Optical Company, in *The Educational Focus*: "Prestige is one of the most important assets of any business. It is a measure of the standard of the products manufactured. It is the criterion of a company's policy. It is assurance and insurance of quality. It is to a commercial house what character is to an individual — the foundation of confidence. But the accountant can never place it on his books, because you cannot buy prestige. Prestige must be earned."

¶ By JOSEPH W. BARKER '16, Dean of the Columbia University School of Engineering, in a letter to Dr. Nicholas Murray Butler in reply to President Roosevelt's recent letter to school and college heads stating that the training afforded by engineering schools has neglected social responsibility: "Education must consider these social impacts of engineering from a dispassionate and non-political point of view. We must not indoctrinate our young students for or against any particular social program, but must present arguments both pro and con against which and

in the light of their later practical experience they can form their own judgments."

¶ By RICHARD BELL '34, a paper on the ball-clay industry, presented at the October meeting of the American Institute of Mining and Metallurgical Engineers held at the Pennsylvania State College.

¶ By RALPH D. BENNETT, Staff, an article, published with Dr. Dorothy Heyworth of Wellesley College, on work done last year on conditions affecting the size and frequency of large cosmic-ray bursts.

¶ By DUGALD C. JACKSON, Staff, an article, "Critique on Electrical Industries in Japan," *Electrical World*, July 18. Herein Dr. Jackson stated: "It is time for American manufacturers and American exporters of manufactured products to discard the oft-repeated view that the Japanese are mere copyists and that their success as competitors for international trade in manufactured products is a temporary phenomenon which will prove to be a flash in the pan. . . ."

Dr. Jackson continued: "Many successive generations occupied with home handicrafts have left firmly established habits of the people in Japan, and the development of mass industry has not eradicated the home and village industries which give incidental or complete occupation to many people."

In the News

¶ HERBERT A. WILCOX '87, as principal speaker before the Mining Association of the Southwest on September 10. His talk was largely devoted to mining activities in China and South Africa.

¶ ALBERT A. SCHAEFER, Staff, as speaker on "Whither America?" before the Women's Scholarship Association, Boston, October 29.

Anniversary Meeting

¶ A joint meeting of the Founder Societies of the American Institute of Physics, which embraces the American Physical Society, the Optical Society of America, the Acoustical Society of America, the Society of Rheology, and the American Association of Physics Teachers, took place in New York City on October 29 to 31. This meeting, fuller details

of which are given in the Trend of Affairs section, was a celebration of the fifth anniversary of the founding of the Institute and at the banquet opportunity was taken to pay tribute to KARL T. COMPTON, a member of the governing board, for his large contributions to the Institute's origin. Dr. Compton delivered an address entitled "What Is Ahead in Physics."

JOHN E. BURCHARD '23 spoke on "Building — The Forgotten Child of Physics." E. R. SCHWARZ '23 spoke on "Optics and the Textile Industry" at the symposium over which A. C. HARDY '18, President of the Optical Society of America, presided. Another paper, "Fluorescent Light Microscopy — A New Method in Colloid Physical Research," was presented by E. A. HAUSER, Staff, and C. J. Frosch.

MAYO D. HERSEY '09 of Brown University is first vice-president of the Society of Rheology, one of the Founder Societies of the American Institute of Physics.

DEATHS

* See class notes for account.

☞ CHARLES F. LAWTON '77, September 26.*

☞ HARRY C. SOUTHWORTH '77, October 17.*

☞ AUGUSTUS H. GILL '84, November 11.

☞ MORTIMER SEARS '96, October 6.

☞ WORTHINGTON CORNELL '98, September 29.

☞ FINLAY F. FERGUSON '98, October 7. Mr. Ferguson, a widely known Virginia architect, drew plans for the Virginia Museum of Fine Arts, Phi Beta Kappa Memorial Hall, and Grace Covenant Presbyterian Church in Richmond, and Ghent Methodist Church, First Presbyterian Church, and Obef Sholon Temple in Norfolk.

He was formerly a member of the advisory committee of architects on restoration work at Williamsburg, Va. He was a trustee of Norfolk Academy and belonged to the board of the Norfolk Public Library, the Norfolk Society of Arts, and Sigma Chi.

☞ GEORGE GLEASON '99, October 7.

☞ WARREN BLEECKER '01, June 13.*

☞ FREDERICK J. DULUDE '01, August 15.

☞ JOSEPH K. HEYDON '08, date not known.

☞ AUGUST G. ODDLEIFSON '22, October 20.*

☞ WILLIAM R. HOGAN '27, September 13.

☞ JAMES J. DEERY '30, September 6.

☞ S. LEON KAREL '30, September 27.*

COMPARATIVE SCHOLASTIC STANDINGS OF UNDERGRADUATE ACTIVITY, DORMITORY, AND FRATERNITY GROUPS

(Based on June 1936 Ratings)

	Average	Increase Over June, 1935	Corresponding Rank in June, 1935
1. Officers of the M. I. T. A. A.	3.97	0.37	5
2. Tau Beta Pi.	3.95	*0.04	1
3. Alpha Chi Sigma.	3.80	0.05	2
4. Chi Epsilon.	3.725	**	..
5. Wearers of the "T"	3.72	0.564	30
6. Officers and Representatives, Combined Professional Societies.	3.67	0.04	3
7. Phi Beta Epsilon.	3.61	0.78	44
8. Chi Phi.	3.60	0.23	13
9. Theta Delta Chi.	3.57	0.23	14
10. Voo Doo Staff.	3.55	0.231	17
11. Institute Committee.	3.54	0.416	32
12. T. E. N. Staff.	3.513	0.013	8
13. Technique Management.	3.51	*0.06	6
14. Sigma Alpha Epsilon.	3.49	0.62	43
Average of 167 men engaged in athletic activities.	3.490	0.175	..
15. Wearers of the Varsity Athletic Insignia other than "T"	3.464	0.092	12
16. Delta Psi.	3.45	0.29	29
17. Varsity Sports Captains.	3.442	0.167	22
Average of 674 men in 25 activity groups.	3.44	0.09	..
18. The Tech Staff.	3.420	0.254	28
19. Combined Musical Club Performers.	3.41	*0.01	11
Average of 203 men holding managerial positions.	3.40	0.158	..
20. Voo Doo Management.	3.399	0.271	31
21. Phi Beta Delta.	3.39	0.48	42
Average of 210 men engaged in publications activities.	3.375	0.050	..
Average of 170 men on staffs of activities but not holding managerial or executive positions.	3.366	0.072	..
22. Sigma Alpha Mu.	3.36	0.03	15
23. Beta Theta Pi.	3.34	0.115	25
24. T. E. N. Management.	3.335	*0.215	7
25. Tech Show Management.	3.323	0.498	45
26. Varsity Sports Managers.	3.313	0.248	37
27. Sigma Nu.	3.30	0.184	33
Average of all dormitory residents.	3.30	0.00	..
28. Kappa Sigma.	3.29	0.08	26
29. The Tech Management.	3.287	*0.143	10
Average of 129 men engaged in dramatics and musical activities.	3.284	*0.052	..
Average of all undergraduates.	3.28	0.04	..
Average of all fraternity men (Does not include Tau Beta Pi and Alpha Chi Sigma).	3.25	0.12	..
30. Delta Upsilon.	3.248	*0.032	21
31. Delta Tau Delta.	3.245	0.019	24
32. Dorm Committee.	3.227	*0.253	9
33. Phi Delta Theta.	3.21	*0.10	18
34. Theta Xi.	3.199	0.093	35
35. Alpha Tau Omega.	3.198	0.288	42
36. Phi Kappa Sigma.	3.189	0.079	34
37. Lambda Chi Alpha.	3.188	0.528	48
38. Phi Sigma Kappa.	3.17	0.11	38
39. Delta Kappa Epsilon.	3.165	0.115	39
40. Tech Show Staff.	3.143	0.183	41
41. T. C. A. Cabinet.	3.12	0.30	46
42. Phi Gamma Delta.	3.11	0.01	36
43. Tech Show cast, chorus, orchestra.	3.09	*0.144	23
44. Combined Musical Clubs Management.	3.044	*0.262	19
45. Phi Mu Delta.	3.04	*0.28	16
46. Sigma Chi.	3.035	*0.168	27
47. Phi Kappa.	2.96	*0.04	40
48. Technique Staff.	2.92	*0.381	20
49. Theta Chi.	2.68	*0.126	47

* Decrease

** Not ranked

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Cleveland Luncheon

The presence of a large number of Technology men in Cleveland during the week of October 19 for the meeting of the Institute of Metals and Iron and Steel Divisions, jointly with the American Welding Society, the Wire Association, and the American Society of Mechanical Engineers, offered opportunity for a Technology luncheon, which was unofficial as far as the Cleveland Club was concerned. Under the direction of George B. Waterhouse, Staff, who, with several other members of the staff was in attendance, the luncheon lasted about an hour and a half. The one Cleveland man present was H. B. Pulsifer '03, who is in charge of the research laboratory for the American Steel and Wire Company. Professor Waterhouse called on him to welcome the group to Cleveland, which he did, and devoted about six minutes to making them all feel at home. A good many questions were asked about conditions at Technology, which were answered by Professors Homerberg '21, Norton '18, Waterhouse, and others. Everybody agreed that the luncheon was worth while.

There were 29 men present: P. P. Alexander '33, F. S. Badger, Jr., '27, Walter G. Bain, Jr., '36, Miss Frances Hurd Clark '26, Morris Cohen '33, Walter Crafts '26, L. S. Gifford '31, C. D. Grover '22, W. L. Hamilton '26, T. G. Harvey '28, C. H. Herty, Jr., '21, V. O. Homerberg '21, A. B. Kinzel '21, F. S. Klock '36, J. R. Long '35, Oscar T. Marzke '32, R. F. Miller '34, John T. Norton '18, H. B. Pulsifer '03, A. A. Rostartchuk '34, J. W. Sands '23, H. N. Solakian '17, Dale D. Spoor '22, A. M. Talbot '34, Rudolph Tietig, Jr., '32, G. B. Waterhouse, Staff, R. K. Wells '24, E. F. Wilson '26, and I. N. Zavarine '20.

Technology Club of Chicago

Our first meeting of the season was held October 16 at the Chicago Engineers Club. B. Alden Thresher '20, our new Director of Admissions, gave us a distinctly valuable account of Technology conditions, outlining the procedure of acceptance of incoming students. The Alumni are of great assistance in making personal contacts with prospective students and it is a welcomed mission of the clubs to be a connecting link between the Admissions Office and the preparatory school students throughout the country. Our Club is extremely grateful to Professor Thresher for having visited us.

An announcement was made that weekly luncheons would be held at the Chicago Engineers Club, 314 South Federal Street

(one-half block south of the Loop post office), on Wednesdays. — EDMUND G. FARRAND '21, *Secretary*, 1290 Old Colony Building, Chicago, Ill.

Technology Club of Southern California

A dinner meeting of the Club was held at 6:30 P.M., October 21, at the University Club of Los Angeles. The meeting was called for the purpose of honoring Dean H. E. Lobdell '17, who was visiting our city for the first time in four years. It was a little slow in getting away to a start because a number of the members could not make up their minds which was the bigger attraction — Dean Lobdell or the University Club bar. For a while it looked as though we might have to hold a meeting in two sections, either by broadcasting the Dean's speech in the bar by radio, or having him repeat his remarks in the bar after the meeting in the dining room. However, after some clever round-up work on the part of your officers, the gang finally got together and enjoyed a very nice dinner.

After the introductions, it was found that there were 47 members present. Vice-president Robinson '24 took the opportunity to call our attention to the fact that the Class of '24 had a larger representation at the meeting than any other. — Your Secretary then announced that there had been some expenses which he had met out of his own pocket and that he had been lying awake all the night before trying to figure some way of reimbursing himself. Along about dawn, he rolled over, fell out of bed, and got a good idea — to conduct a raffle of a \$15 electric razor, selling chances at 50 cents each. The raffle proceeded, with almost 100% response, only one member refusing to purchase a ticket. Vice-president Robinson held the lucky ticket. He stated he already had a razor, so he auctioned it off for \$9.25, thereafter magnanimously donating this sum of money to the treasury. We hope that if he ever raises a beard, it will be a nice, bushy, handsome one, as a reward for his kind deed.

President Kingsley '23 thereupon introduced Dean Lobdell, who gave a very interesting, rambling talk about the Institute, shoes, ships, sealing wax, and cabbages and kings. After his talk, he answered a number of questions in which every one was greatly interested. — CHARLES H. TOLL, JR., '23, *Secretary*, Western Pipe and Steel Company, 5717 Santa Fe Avenue, Los Angeles, Calif.

Technology Club of New Hampshire

The annual meeting of the Club was held October 16 at the Concord Country Club with a total attendance of 36. There

were 31 Technology men, two Technology women, and three guests. Several of the men played golf in the afternoon. A splendid dinner was served at 6:30 P.M. with President Roberts '04 as toastmaster, after which the group retired to the lounge for speeches and business. The members stood in silence, a tribute to the memory of John C. Chase '74 who had died since the last meeting.

The Cambridge delegation consisted of Samuel C. Prescott '94, Dean of Science; Donald G. Robbins '07, President of the Alumni Association; Professor William H. Timbie of the Electrical Engineering Department; Charles E. Locke '96, Alumni Secretary.

Professor Locke, the first speaker, brought the greetings of Dr. Compton and of Professor Rogers who was scheduled to be present but could not because of classes. He also spoke of alumni activities. Professor Timbie took for his subject, "A Liberal Education," defining it as one that fitted the student for his life's work. Technology today gives just such an education.

Mr. Robbins quoted from the report of President Compton in regard to future buildings and increased educational facilities. In spite of a limited enrollment in the freshman class, present buildings and equipment are inadequate due to the great increase in postgraduate work. Professor Prescott described the changes in the various courses at the Institute. These changes are due to the changing conditions in industry. Whereas years ago the largest courses were those teaching mechanical and civil engineering, today they are chemical and electrical engineering. He spoke at some length on the stabilization of enrollment. This scheme limits the number of men who can enter the freshman class and is in effect this year for the first time.

The records of the last annual meeting were read and approved; also a financial statement. The nominating committee — Langley '19, Jackson '95, and Africa '15 — presented the following names for officers: President, Guy A. Swenson '12; Vice-presidents, Walter D. Davol '06, Albert L. Clough '91, and Charles Rich '26; Secretary-Treasurer and representative to the Alumni Council, Malcolm C. Mackenzie '14. They were duly elected. — With the singing of the Stein song, the meeting closed. It was the most enthusiastic meeting the Club has had in recent years.

In addition to Professor Prescott, Mr. Robbins, Professor Timbie, and Professor Locke, the guests included Mr. Stewart Nelson, Mr. R. E. Tucker, and Mr. C. A. Moody. Members of the Club who attended were: Walter M. Africa '15, Norwin S. Bean '94, Elmer R. Bjurling '30, Jere R. Daniell '97, Walter D. Davol '06, Horace A. Emerson '27, Frederic E. Everett '00, Carl A. Hall '08, L. Standish

Hall '14, Amasa A. Holden '99, Marjorie A. Holden '31, Richard S. Holmgren '19, Samuel P. Hunt '95, Henry D. Jackson '95, and Harold E. Langley '19.

Still others were Edward B. Locke, Jr., '34, Malcolm C. Mackenzie '14, Philip F. Maher '17, Thomas H. Murphy '34, Mrs. Louisa M. Norton '13, Clarence L. Nutting '19, Claude H. Rice '28, Charles Rich '26, Arthur O. Roberts '04, Guy A. Swenson '12, Herbert D. Swift '15, Leigh A. Thompson '05, George W. Waymouth '16, and Stearns H. Whitney '23. — MALCOLM C. MACKENZIE '14, *Secretary*, The Benjamin Chase Company, Derry Village, N. H.

Technology Club of Panama

Our ranks have been augmented by the arrival of Major W. D. Styer '22, the newly appointed assistant engineer of maintenance of the Panama Canal. — Wedding bells have been ringing: Miss Margaret Pinkham and Ken Ryder '34 were married in Quincy, Mass., on June 14 and are now living in Balboa. Ken is still with the transportation division of the Canal. — Miss Grace Golder and George Dunlap '35 were married at St. Luke's Cathedral in Ancon on July 11. They are now back on the Zone after a honeymoon in Bajo Boquete, Republic of Panama, and are living in Ancon. Grace is from Arlington, Mass. — Miss Constance Byrd and Manuel Calderon '30 were married on March 5 at the Sacred Chapel in Ancon and, after a two weeks' trip to Costa Rica, are now living in Panama City.

Nelson Thorp '35 and Mrs. Thorp left for the States on September 20 for a three months' vacation in Pennsylvania, Rhode Island, and the East. — Ernest Kneale Dockstader '35 and Mrs. Dockstaders sailed for the States on September 6 for a three months' vacation. They intend to spend considerable time around Boston. — Earl Murphy '34 has been entertaining his *fiancée*, Miss Eleanor Cox of Quincy, Mass., who was in Panama on a two weeks' visit. Dick Brown '35, Mal Stevens '34, Nelson Thorp '35, Ken Ryder '34, Jack Carey '34, George Dunlap '35, and a host of our friends here on the Isthmus attended a dinner given by Murphy in honor of Miss Cox. A dance at the Strangers Club in Colon and the usual tour of cabarets followed.

Don Gutleben '35 left the Isthmus on vacation last July. Rumor has it that he is now working for a sugar company in California. — Eduardo Icaza '23 has been appointed local engineering representative in Panama and the Canal Zone for the Carrier Engineering (air conditioning) Corporation. — A. W. Brooks '11 has been acting municipal engineer of the Panama Canal during the absence of the regular engineer. — I. F. McIlhenny '23 and family of Balboa left here for a long vacation in Cleveland, Ohio.

The following notice comes from the Panama paper of September 6: "Captain Frederick H. Cooke ('00), who was well known on the Isthmus as assistant engineer and later as designing engineer be-

tween 1912 and 1917, died at the Naval Hospital in Brooklyn, N. Y., on August 28. . . .

"Born in Cincinnati, Ohio, Captain Cooke attended the M.I.T., graduating with a degree in civil engineering. After two years as a draftsman at the Portsmouth Navy Yard, he began his Navy service in 1904 as a lieutenant in the Bureau of Yards and Docks. Coming to the Isthmus in 1912 he first served as an assistant engineer in the chief engineer's office. In this capacity he went to Washington and played an important rôle in the consideration of problems relating to contracts for coaling plants at Cristobal and Balboa. After attaining the rank of lieutenant commander on July 20, 1914, he became designing engineer in charge of work on the drydocks and the coaling plants.

"On a number of occasions he was commended for his initiative and resourcefulness by Colonel Goethals. Many of his friends on the Isthmus remember him not only as a fine engineer but as a genial friend and splendid citizen who added much to the life of the community. After leaving the Isthmus, he served for four years as engineer-in-chief for the Republic of Haiti. He visited the Zone for three days in 1930.

"Captain Cooke is survived by: his wife, Olga Ford Cooke, who was a cost accountant for the Isthmian Canal Commission; two sons, one of whom is now at the M.I.T.; and a daughter." — GEORGE C. DUNLAP '35, *Secretary*, Box 28, Balboa Heights, Canal Zone.

M.I.T. Club of Western Pennsylvania

Professor R. E. Freeman, Head of the Economics Department, and Professor B. A. Thresher '20, Director of Admissions, were the guests of the Club at a dinner meeting in the University Club, Pittsburgh, on October 14. This was a return visit for Professor Thresher and the first for Professor Freeman. There was a good turnout for the dinner, whether because of the pleasant recollections of Professor Thresher's previous visit or because of the double-feature attraction, we cannot say. In any case, it becomes obvious that the reputation of the dinners which have been addressed by Institute Faculty members sets a standard which is going to be a strain on the Club's officers to maintain for the rest of the year. It may very well be that, proving unequal to the task, they will petition the Faculty to send us the team of Freeman and Thresher again at a very early date.

Dean E. A. Holbrook '04 of the University of Pittsburgh School of Engineering, President of the Club, presided over the meeting and introduced the speakers with his customary geniality. Professor Thresher talked to us of Institute affairs, problems of admissions, transfers, and so on. Professor Freeman discussed the increased interest of the student body in economics and related subjects during the last few years and talked briefly of recent economic events bearing on the three-

country devaluation agreement. A general question period followed. — CHARLES M. BOARDMAN '25, *Secretary*, Duquesne Light Company, 435 Sixth Avenue, Pittsburgh, Pa. JOSEPH L. THISTLE '32, *Assistant Secretary*, Burrell Technical Supply Company, 1936 Fifth Avenue, Pittsburgh, Pa.

Technology Club of Rochester

On July 25, 24 members of the Club with their wives, sweethearts, and *fiancées* gathered around the festive board of the Monroe Country Club. The tables were set up in the shape of a huge T. The word "Technology" was written out on the tables in large red letters cut from Kodapak. Large bouquets of red gladioli and gypsophylas decorated the tables, together with tall gray candles. Cardinal and gray place cards carried out the color scheme and helped to acquaint the guests. Golf and tennis matches preceded the dinner in the afternoon. Dancing in the evening made the affair, which was the second of its kind this year, quite successful, and sent the old graduates home with a feeling akin to undergraduate days and a clamoring for more such parties.

The only real old-fashioned New England clambake in Rochester was held in conjunction with the annual meeting at "The Highlands," the summer home of Bill Vicinus '23, on October 3. Forty-eight members of the Club enjoyed a "bake" that is fast becoming the envy of all Rochester. The afternoon rapidly passed amid contests of varied and questionable skill. The annual ball game was won this year by the even classes, who nosed out the odds by the score of 11 to seven. Dobrochowski '36 was invincible on the mound, and Gregg Smith '30, as captain, received the Technology (galvanized) Bowl, symbolic of the championship. Ollie Angevine '36 exhibited old-time Boy Scout skill in frying eggs faster than anyone else with his small bundle of wood and single match. Dick Wilson '30 proved to be a ten-second man in the beer-drinking contest, when his pint had vanished. Red Cull '34 retained his sharpshooting honors this year by scoring 32 of a possible 35 at 20 paces with a horse pistol. Gregg Smith and Phil Kron '34 lost their egg-throwing championship to Windy Wynd '27 and Hank Couch '20 when Kron made the most spattering catch off his chest. Many other games were enjoyed as some members and the scholarship fund prospered.

After a most delicious dinner, the annual meeting was called to attention by Edward S. Farrow '20, chairman *pro tempore*, at 7:30 p.m. C. C. Culver '96 proposed a rising vote of thanks for the past, present, and future annual meetings and clambakes to be given by Bill Vicinus. The minutes of the previous meeting were dispensed with. A single unanimous ballot was cast for the following new members who were elected to membership: Oliver L. Angevine, Jr., '36, A. L. Cobb '26, Vincent J. Dobrochowski '36, Charles Evans '36, Ralph Evans '28, Daniel Finucane '36, George Grant, 3d, '36, David MacAdam '36, and Lee Rusling '34.

The Treasurer's report was read by Frank Thorne '27 and accepted. It showed that the scholarship fund had gone over the top for the first time since 1931. The number of dues paid during the past year, however, slightly decreased. The Club is still in excellent financial condition and no fears were expressed.

John F. Ancona '03, chairman of the scholarship committee, made the announcement of the annual scholarship award. It was divided among three candidates from this section who had received similar awards from the Institute. They were: Paul A. Reynolds of Cuylerville, John C. Artz, Jr., of Pittsford, and William G. Peck of Bergen. A favorable report was also made on previous winners now in their undergraduate years at Tech.

Mr. Ancona also made a report on the activity of the national nominating committee of which he is a retiring member. The nominating committee, consisting of Donald Webster '16 as chairman, C. L. A. Wynd '27, and Henry Couch '20, presented the following slate of officers for the coming year, and it was unanimously accepted: Andrew Langdon '22, President; C. J. Staud '24, 1st Vice-president; Robert E. Smith '33, 2d Vice-president; E. Philip Kron '34, Secretary; David L. Babcock '33, Treasurer; Joseph A. Parks, Jr., '28, Executive Committee, 1937 to 1939. The following continue as members of the executive committee: John F. Ancona '03, 1935 to 1937; Kendall B. Castle, Jr., '24, 1936 to 1938. — E. PHILIP KRON '34, *Secretary*, Building 23, Kodak Park, Rochester, N. Y.

Washington Society of the M.I.T.

The fall program of the Society was auspiciously launched with two well-attended luncheon meetings held at the University Club, Washington, D. C. At both these functions, Harry W. Tyler '84, President of the Society, presided.

The first of these meetings, held September 18, was addressed by R. E. Bakenhus '96, public works officer, 3d naval district, New York City, who spoke on the work of the Corps of Civil Engineers, United States Navy. The recent death of Walter Clark Dean '00 was reported, and J. W. Clary '96 read the following tribute to his memory: "It is appropriate for this Society formally to pay tribute to the memory of one who for 25 years was one of its very active members; who held several offices, including that of president; and who was a valued friend of many of us.

"Walter Clark Dean died suddenly on Sunday, August 16, while spending the day with a party of other lovers of the great outdoors at one of his favorite spots on the Potomac River. Dean was a native of Pennsylvania, a graduate of Phillips Exeter Academy, Class of 1896, and of Course VI, M.I.T., Class of 1900. His two sons, Walter Brundage Dean '28 and Albert Gardner Dean '31 are also graduates of the Institute. Nearly all of his active life was spent in the employ of the Navy Department, where he was identi-

fied with the development of much of the electrification of the Navy. At the Norfolk Navy Yard, where he was stationed for about nine years beginning in 1901, he installed a number of the early radio stations in that vicinity and developed and installed interior communication and fire-control systems on naval vessels.

"Transferring to the bureau of construction and repair in 1910 as electrical aide and later as senior electrical engineer, head of the electrical-mechanical section, he promoted and supervised the application of electrical power to a continually increasing variety of auxiliary machinery and appliances. Particularly he pioneered in the application of electrical hydraulic drive to steering gear windlasses, winches, and so on, and in the installation of electric galleys and other modern appliances.

"He was an enthusiastic worker in every organization of which he was a member. His services to this Society we well remember. He served several terms as treasurer of the Washington Society of Engineers and was long a valued member of its directorate. Of late years he has been a very active member and one of the councilors of the Potomac Appalachian Trail Club. He was a nature lover. Throughout his life his favorite recreation was to take to the woods, mountains, or shore, accompanied by members of his family who invariably shared all of his pleasures.

"He was a quiet and modest man, yet of social disposition and accomplishments. His genial personality and his thoughtfulness of and for others drew to him a large circle of friends who will long remember his hospitable home and the harmony of the family it sheltered. Clark Dean was taken in the afternoon of his life when it seemed that he had every reason to look forward to a calm and beautiful sunset, but he leaves a record and a memory of which any man might well be proud."

The Society's second meeting of the season, held October 16, was addressed by Major General E. M. Markham, chief of engineers, United States Army. General Markham spoke on "Some Aspects of Flood Control" and in the course of his talk sketched a broad perspective of this important problem which has been so forcefully brought to public attention by the disastrous floods of last spring. Honorary Secretary Proctor L. Dougherty '97 spoke of the splendid record of the local winners of regional scholarships, now studying at the M.I.T.

The following were present at one or both of the above meetings: H. W. Tyler '84, Allen Pope '07, Phil P. Greenwood '07, Merwin Scott Dickson '34, W. H. Hubbard '00, William B. Poland '90, Jack R. Bloom '30, Al F. O'Donnell '19, Charles H. Stratton '00, Charles Bittinger '01, A. H. Ronka '23, Harry L. Grant '00, James Swan '91, J. C. Dort '09, D. G. Shingler '21, H. L. Robb '21, H. P. Sweeny '08, Louis J. Grayson '19, Frederick W. Swanton '90, B. P. Du Bois '92, C. W. Duffy '20, F. E. Fowle '94, W. K. MacMahon '22, Edmund H. Lloyd '33,

John D. Fitch '24, Horace R. Byers '32, L. W. Conant '21, E. S. Land '06, E. S. Pomykala '23, and O. L. Hooper '23.

Others who attended were F. W. Willcutt '27, W. I. Swanton '93, J. W. Clary '96, C. H. Godbold '98, W. A. Zisman '27, George D. Mock '28, Max C. Mason '12, E. T. Steel '05, Gordon R. Williams '29, Ben E. Lindsly '05, H. S. Bailey '05, H. M. Loomis '97, R. K. Thulman '22, Dale D. Spoor '22, W. M. Corse '99, Sullivan W. Jones '00, A. L. Sherman '06, A. W. Greely, Jr., '13, William E. Swift '95, George A. Nichols '95, Proctor L. Dougherty '97, William D. Rowe '24, A. M. Holcombe '04, W. A. Danielson '26, Henry E. Worcester, Jr., '32, Joseph B. Paul '32, Welton A. Snow '14, G. W. Stone '89, L. F. Hewins '98, M. I. Walters '23, J. Garfield Riley '06, F. W. Southworth '00, C. P. Kerr '11, George W. Stose '93, A. B. McDaniel '01, M. L. Emerson '04, W. Bion Moore '28, M. O. Zigler '30, L. C. Reyna '23, John C. Damon '05, Allen Addicks '21, E. P. Roll, Jr., '23, B. A. Howes '97, R. H. Blatter '22, P. H. Thomas '93, F. O. Billings '24, J. Y. Houghton '26, John Nolen, Jr., '20, R. E. Bakenhus '96, C. W. Perley '96, George E. Stratton '96, A. E. Hanson '14, J. E. Nolte '98, W. C. Mehaffey '17, and A. Esner '21. — JOHN D. FITCH '24, *Secretary*, 35 Montgomery Avenue, Kensington, Md.

CLASS NOTES

1877

We present first Hackett's communication to which reference was made in last month's issue: "A recent photograph of the members of the Class of 1877 who attended their last gathering disclosed a group of substantial citizens with whom it is a pleasure to associate. Character and high purpose are clearly indicated in their mien, and nothing whatever suggests that these venerable and dignified gentlemen were ever subject to the frivolous and frisky antics which at times possess younger classmen. It is for the purpose of disclosing that even these highly respected ones were much as other lads ever have been and will continue to be that this long-forgotten incident in their career is recalled.

"One bright October morning which emphasized the fleeting attractions of Indian summer, in Rogers Building of pleasant memory, a lecture was scheduled at 11 o'clock on a subject which did not excite general enthusiasm among the students, and a few of the wilder spirits were wont to cut it. As the class filed into the lecture room, a tall, handsome lad stood near the door looking for a victim. He was a little older than the average and much more sophisticated. He spotted a young, innocent lad with a credulous look in his eye, one without experience in the wiles of a wicked world and who may well be called 'Green.' The tall one beckoned Green aside and said in effect: 'Look here, old man, I have just got word that my grandmother is very sick and I

must hurry away at once. Can't stop for that interesting lecture on logic. When my name is called, you just say, "here," and I will do as much for you. All right, thanks. Now I have to hurry." He vanished with some celerity, but not in the general direction of his family relatives, who lived in Ohio, as it developed later. The handsome lad will be called 'Downs, W. E.,' because that is not his name.

"The class settled itself, got out notebooks, sharpened pencils, and tried to assume an air of interest. The professor, who was doubtless a very learned man, looked over his spectacles with an expression which was far from cordial, picked up the class list and proceeded to call the roll with a view of checking absentees. As the list was alphabetical, the name of Downs, W. E., came early in the proceeding. It was responded to promptly by Green, but not obstreperously, and the list continued for a few names when a foreign thought seemed to strike the presiding pundit. He stopped and looked over his glasses rather sharply and then said: 'Er, Downs, W. E., won't you please stand up?'

"Of course, it was a moment of embarrassment to one young student in particular, but he maintained a modest silence. Boys near at hand whispered: 'Keep still. Look like a minister,' and other words of appropriate advice. After a pause which seemed long, the professor grunted as if he had solved an equation and proceeded with the program without further comment. It was learned later that some one had tipped off the professor to the fact that Downs, W. E., was up to little tricks at times. This fact he recalled as he passed the name, and hence the hiatus.

"Of course Downs, W. E., heard of the incident and hastened to the professor to square himself. He stated that the occurrence was entirely without his sanction and that he was very much surprised that it should happen. Professor Howison was a man of few words but of deep penetration. He looked the culprit in the eye for a moment and then said meaningly: 'Downs, W. E., if such an event should occur again you will be the subject of a very much greater surprise.' — And the curtain fell."

The following letter with the sheet referred to was received from Henry Hibbard in reply to my request "to give an account of his summer's vacation": "Glad to get your letter. On the sheet herewith I give a synopsis of the chief events of my trip abroad, which you ask for. Use any part or none as you wish. — In a week or two I am going to motor to Boston to see my relations and friends there and would like to call on you if you are to be there. I also want to see Fred Wood if he is at Townsend then. I wrote to him from London but have had no reply. — I appreciated the paper you sent me which bore the signatures of the class members at the lunch. Probably we can never have 14 at our annual meet again as we had last year. . . ."

"The sheet": "Three months abroad this summer, mostly spent in London to be near my daughter and only grandson.

I spent much time in museums. — At the museum of the Public Records office I saw Domesday Book and the 'scrap of paper,' the violation of which by Germany led to her defeat in the Great War. At the Royal Institution I saw Faraday's first induction coil on which the electrical industry was founded — insignificant to look at but awe inspiring in view of what it began. At the Science Museum was Wright's first airplane and a thousand other things of the greatest interest; at the Geological Museum, also wonderful exhibits. At South Kensington I saw the great collection of minerals including a specimen of chialstolite of which I knew the history, from Lancaster, Mass., near George Bartol's boyhood home. At the British Museum I found again metallic molds for die casting bronze axes in the Bronze Age. This art has been reinvented many times since then.

"The art galleries were wonderful. At the Tate Gallery the statue 'Dawn' is for me the most beautiful piece of marble in the world. — We attended a reception at the Royal Society rooms and I sat in the president's chair. — We made one trip out of London, including Leamington, Stratford, Coventry, Sulgrave, and Oxford. At a new steel works at Corby I saw astonishing work. They make welded steel pipe literally by the mile and cut it off, as made, in lengths to suit.

"Leaving England we flew from London to Amsterdam in two hours. By land and water it would have taken 12 hours. We did the sights of Amsterdam, Haarlem, The Hague, Scheveningen, Delft, and Rotterdam, and sailed for home on September 5, happy in the thought."

Mr. Hibbard called for me on his way to Townsend to call on Fred Wood. We found him recovering from an illness due to high blood pressure. We were fortunate to find him, as they were planning to go to Baltimore the next day.

A notice of the death of Charles Follen Lawton was sent to me by Arthur L. Plimpton. I have tried below to give an account of his long and busy life: "Charles Lawton was born in New Bedford, Mass., September 21, 1856, the son of James M. Lawton, a prominent citizen of New Bedford in his time, and Sarah G. Cranston. He had the following brothers and sisters: James M., Jr., Robert, William Cranston, Professor in one of the New York colleges, Annie, and Lizzie F. Lawton. He received his early education in the New Bedford schools and was graduated from the M.I.T. as registered civil engineer. He first found employment as civil engineer in New Bedford, working in the street and water department. In the fall of 1878 he went into the employ of the Arkansas, Atchison, Topeka and Santa Fe Railway as rodman on construction through the Grand Canyon. In 1879 to 1880 he was rodman and transit man on preliminary location in New Mexico on the Atchison, Topeka and Santa Fe Railway; transit man on preliminary lines in southern Arizona, for this same railway; and leveler and transit man on location for Atlantic and Pacific Railway, Arizona. In 1881 he was division engineer

on the Atlantic and Pacific Railway, Arizona, and remained with this road until the spring of 1882. During this time he had charge at different times of locating expeditions working in what was then unsettled and, in fact, uncivilized country and in charge of such men as were to be found there in those days.

At the time of the raid of Victoria, the famous Apache chief, Mr. Lawton was in charge of such an expedition and came up from Mexico, through Arizona and New Mexico, into Colorado, often being less than a day's ride behind the Indians. Upon completion of the Atchison, Topeka, and Santa Fe road he was employed at bridge building and other railroad work in the Mohawk Valley, N. Y., and in New Hampshire. In the fall of 1884 he took charge as superintendent of the railroad company's coal mines in Anthracite, Colorado. From there he was transferred to a five-shaft mine in Frontenac, Kansas, belonging to the same company. In the year 1891 he was in the employ of the Niagara Water Power Company, for which he made preliminary surveys, measurements, plans, and so on, upon which this famous engineering feat was accomplished. He superintended the building of the tunnel which conveys water down through the solid ledge from the level of the falls to the river below. The accuracy of the surveys and workmanship of this tunnel have been the subject of many newspaper and magazine articles in the past few years. Upon the completion of this work he entered the employ of the Cincinnati, Chicago and St. Louis Railway Company with headquarters at the engineering department in Cincinnati, Ohio. He was appointed superintendent of public works, city of New Bedford, Mass., in 1896, filling that office up to 1900; since then, superintendent of streets and sewers, shade trees, and construction of new work constantly arising. Mr. Lawton had been in poor health for more than a year, suffering from general arteriosclerosis. He died on September 26.

Mr. Lawton married Annie Marie Ryder, June 16, 1884. Harry C. Lawton was born in 1888. In 1900 Mr. and Mrs. Lawton adopted a daughter, Marion, who was then five years old. The couple observed their golden wedding anniversary in 1934. Mrs. Lawton died in 1935.

In addition to Harry and Marion, mentioned above, Mr. Lawton is survived by a daughter-in-law, Hope; two grandchildren; two sisters, Mrs. Paul Ripley of Natick and Mrs. Elizabeth L. Perry of Long Island; and a brother, William C. Lawton of New York City.

Word has been received of the death of Harry Colby Southworth, October 17, at West Stoughton, Mass. An account of his life will be in our class column in the next issue of *The Review*. — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1882

Edward Russell Adams, retired official of Alexander and Baldwin, Ltd., died at his home in Seattle, Wash., March 20,

1882 Continued

1935, after an illness of several months. Adams was a member of Honolulu's first board of supervisors, 30 years ago. His father, Edward Payson Adams, served as American consul at Lahaina for several years before Hawaii became a territory. Adams joined the firm of Alexander and Baldwin in 1897 and was one of its oldest members in point of service. He was one of several buyers for the company who went to San Francisco after the fire of 1906 to assist in the reorganization of the firm's offices in that city. He established the Seattle office of Alexander and Baldwin for buying purposes and remained as its manager. He was also a director of the company, retiring from active business life in 1928.

Adams was born in Honolulu, June 23, 1861, the son of Edward Payson and Caroline Wright Adams. Two brothers, John and William, and a sister, Lucy, are dead. Surviving Adams are: his widow, Mrs. Margaret Beck Adams; three children, Mrs. James D. Ingham, Mrs. F. Dickinson Mott, and John Russell Adams; four grandchildren, Caroline and Edward Russell Ingham, Frederick and Gretchen Mott; two sisters, Adella Adams of Pasadena, Calif., and Nina Adams of Honolulu.

Adams spent much of his time out of doors, doing the things he always enjoyed most: hunting and fishing at his country home on the Sound. He was a keen sportsman, finding his chief recreation with rod and gun. Ned Adams was a frequent visitor to his old home town during the last three decades — a man whose genial personality and alert mind endeared him to an ever widening circle of friends who sincerely regret his passing. — ALFRED L. DARROW, *Secretary*, 39 Garrison Road, Brookline, Mass. RACHEL P. SNOW, *Assistant Secretary*, Pin Oakway, Falmouth, Mass.

1888

One of our most distinguished classmates, Edwin O. Jordan, passed away at Lewiston, Maine, September 1. His ill health the previous November compelled him to resign as a member of the Chicago Board of Health, but he had continued his research work at the University of Chicago until he left for Shelburne, N. H., to spend the summer. His family brought him from Shelburne to the Central Maine General Hospital at Lewiston, where his wife, two sons, and a daughter were at his side when death came. The burial was in Chicago.

Dr. Jordan was born, July 28, 1866, at Thomaston, Maine, but was living in Auburndale, Mass., when he entered the Institute. He was on the editorial board of *The Tech* during his undergraduate days and also an editor of our "25th Anniversary Edition" published at the Cotocheset House, Wianno, Mass., in June, 1913. To show his ability as a writer we give a few lines from this special edition describing the famous ball game with '13 as follows: "The baseball game was scheduled for the afternoon. Promptly at the appointed hour, time was called. It is conjectured by those skilled in reading

the stars that had '13 graduated in a lucky instead of an unlucky year, had the game been played with a hard instead of a soft ball, or had '13 known the game better and played as well as they knew, the result might have been different. Sad but unimpeachable details by a '13 scorer are given elsewhere.

"The rain, more singing, and the rush of automobiles to the station ended a day that '88 and '13 will never forget. There is only one graduation day and one 25th anniversary."

We will also give a quotation from a letter to the Secretary, dated June 10, 1935: "I am going to try to get on to Ned Webster's dinner next year and, of course, am counting on the 'Great Fiftieth.' It does seem to have got around pretty fast. I am not quite ready for it yet." This shows his great interest in the Class and his desire to renew the acquaintances he made 50 years ago. We shall miss him very much.

We will conclude by giving the very complete history of Dr. Jordan's life and work furnished us by the Department of Public Relations of the University of Chicago, which he served for 44 years: "Dr. Edwin Oakes Jordan, Andrew MacLeish Distinguished Service Professor Emeritus of Bacteriology, University of Chicago, died September 1, at the Central Maine General Hospital, Lewiston, Maine, as a result of cardiac disease which had been critical for the previous month. . . .

"Dr. Jordan, one of the original members of the faculty of the University, was internationally known for his work on epidemics, food poisoning, and public health. He also was known as one of the early and influential advocates of health education. The University of Chicago department of bacteriology and hygiene, which Dr. Jordan organized, emphasized teaching and research in the field of public health and was one of the early leaders in the improvement of public water and milk supply. Many of the country's public health workers received their training under Dr. Jordan.

"It was the research work organized by Dr. Jordan which developed the decisive evidence in the suit the city of St. Louis brought against the city of Chicago and the Chicago Sanitary District shortly after the opening of the drainage canal, St. Louis contending the canal polluted the downstream water. Dr. Ernest E. Irons and others working with Dr. Jordan demonstrated that bacterial infection from sewage existed only a comparatively short distance downstream.

"The Chicago bacteriologist was elected to the National Academy of Sciences this spring, the latest of a long series of honors he received in recognition of his work. He was a member of the Medical Fellowship Board of the National Research Council, a trustee of the McCormick Memorial Institute for Infectious Diseases, of the American Academy of Science, the National Tuberculosis Association, the Society of Bacteriologists — of which he was president in 1905 — and an honorary fellow of the American Association of Pathologists and Bacteriologists.

"From 1920 to 1927 he was a member of the International Health Board of the Rockefeller Foundation and from 1930 to 1933 was a member of the Rockefeller Foundation board of scientific directors, International Health Division. He was awarded the Sedgwick medal of the American Public Health Association in 1934, being the fifth recipient. In 1932 he was president of the Chicago Institute of Medicine, and was president of numerous other societies during his active career. He was joint editor with Dr. Ludwig Hektoen of the journal, *Infectious Diseases*.

"Dr. Jordan was born, July 28, 1866, in Thomaston, Maine. He took his B.S. at M.I.T. in 1888 and his Ph.D. from Clark University, Worcester, Mass., in 1892. He worked also at the Pasteur Institute, Paris. The University of Cincinnati conferred the honorary degree of Sc.D. on him in 1920. Although he achieved distinction as a bacteriologist, Dr. Jordan's formal training was in zoology, in which subject he took his doctorate. For two years, from 1888 to 1890, he was chief assistant biologist, the Massachusetts State Board of Health. In 1892 he came to the University of Chicago as an associate in anatomy, becoming an instructor the next year. In 1895 he was appointed assistant professor of bacteriology, his department being given space in a basement room of Kent Chemistry Laboratory. In 1907 he was appointed a full professor, and was chairman of the department from 1914 until 1933, when he became emeritus.

"Dr. Jordan in 1893 married Elsie Fay Pratt, who survives. Their children are: Henry Donaldson, Professor of History at Clark University; Edwin Pratt, Chicago physician and a member of the Rush Medical College faculty, who lives at 1080 Crescent Lane, Winnetka; and Lucia Elisabeth, who is the wife of Dr. Charles L. Dunham, assistant in medicine in the University clinics, whose home is at 5639 Kenwood Avenue, Chicago. Dr. Jordan's home was in Homewood, Ill." — BERTRAND R. T. COLLINS, *Secretary*, Chebeague Island, Maine.

1890

Our Secretary, dear George Gilmore, has gone! After several years of increasing disability, he passed on in his sleep the night of September 12. — Born in Charlestown, Mass., he lived most of his life in Lexington. 'Ninety first knew him as a lieutenant in our freshman battalion. On leaving the Institute, he joined the business which his father conducted, now the Middlesex Bleach, Dye, and Print Works, becoming superintendent in 1896 and later acquiring complete ownership which continued until the time of his death.

From the local paper the following is abstracted: "With a remarkably keen mind, extremely alert and well informed, he became one of the leaders in the cotton-finishing industry, and a great influence in establishing coöperation through the form of the open-price association. He was a former vice-president of the National Association of Finishers of Textile Fabrics and the first president of the Tex-

1890 Continued

tile Research Council which was later merged with the United States Institute of Textile Research; he was a member of the National Association of Cotton Manufacturers and for many years belonged to the Textile Institute of Manchester, England. He had also been president of the Lexington Historical Society, a director of the Arlington Mills and of the Webster and Atlas National Bank of Boston, and a life member of the Massachusetts Horticultural Society, the University Club, and the Massachusetts Historical and Genealogical Society. He had belonged to the Lexington Golf Club, Boston Chamber of Commerce, the Union Club, Boston Philatelic Society, and the Merchants Club of New York."

Technology was always a major interest, and he did much helpful work on the executive committee and as president of the Alumni Association and member of the Corporation. No man on the Alumni Council can forget the rapid transaction of business when he was president. He knew what needed to be accomplished and how to do it.

At the funeral service, which was attended by President Compton, by the officers of the Alumni Association, and many other Technology men, Harry Carlson '92 read a tribute from which the following is quoted: "He was a graduate of the Class of 1890 and was justly proud of his classmates, many of whom achieved success and an unusual number of whom attained national distinction. . . . Now we are gathered, friends and neighbors, for the last time in his home. Friend and neighbor—that describes him better than anything else. His friendliness was to me his most attractive characteristic. To see him enter a room with his pleasant smile and his constant carnation would cause all to turn toward him, and in whatever gathering he came he was greeted with the same friendliness that he gave to all. He had no enemies—only friends. He served his country during the War in that honorable group called 'the dollar-a-year men' and gave the best of himself both here and later abroad in the European Cotton Finishing Commission. As president of the Textile Research Council and as vice-president of the National Association of Cotton Fabrics he gave of his best to his profession. But all in all, it was Technology matters that interested him the most. He was permanent secretary of his Class and kept in happy touch with his classmates up to the last. He knew personally more Tech Alumni than any other man in a similar position. We think of him as still with us in spirit—a gentle, gracious spirit that makes us glad that we have known him."

In 1895 Mr. Gilmore married Jessie B. Whiting, who survives him and to whom '90 extends deepest sympathy.

Robert Keith Snow, who studied architecture at Technology after being graduated from Harvard in the Class of '86, died, July 13, *en route* from his home at Santa Barbara to Bar Harbor. After leaving the Institute, he decided to devote his time to music and literary work, becoming one of the editors of *Cosmopolitan* and

for some time worked on *Youth's Companion*. He contributed to magazines, did considerable work in putting novels in dramatic form for presentation on the stage, and wrote several plays which were produced in Massachusetts and New York. In 1907 he bought a farm in Wayland, Mass., but later moved to California where he took up sketching and painting. Examples of his work were shown in three galleries in California. At the time of his death he was bringing water colors for showing in the East.

Simeon B. Eisendrath, notice of whose death was recently received, is recorded as having attended Course IV through the junior year. A short time later he opened his own office in Chicago, where between 1894 and 1900 he was architect for many well-known buildings, among them the Jewish Orphan Asylum and the St. Germaine, the latter the first large Chicago apartment house with an elevator. In 1900 he opened an office in Pittsburgh, but on winning the competition for the Criterion Club House in 1902 moved to New York where he practiced under the firm name of Eisendrath and Horwitz. During this period he is reported as responsible as architect for many notable structures including the Free Synagogue for Dr. Stephen S. Wise, the Home for the Aged in Brooklyn, the Eighth Avenue Temple in Brooklyn, the Terre Haute Temple, the Hebrew Education Society of Brooklyn, and many other institutions. He was also architect for many of New York's restaurants, including Rector's, Palais Royal, Carlton Terrace, and the Garden. In 1930 he served on the committee which formulated the present Multiple Dwelling Law. During all the years of his practice he enjoyed the highest reputation for integrity. In 1912 he married Arlita Leszczynski, who survives him.

Gary Calkins, who is professor in the department of zoölogy at Columbia University, spent part of the summer at Woods Hole, Mass.—The marriage of Richard Hale Goodwin and Esther Bemis on October 13 is announced. The bridegroom is the only child of Professor and Mrs. Harry M. Goodwin and is an assistant in the biology department at Harvard.—Allen H. Rogers has been in the Southwest on professional business.

The following new addresses have been received from the Alumni Secretary: Charles O. Churchill, 858 Belmont Avenue, Springfield, Mass.; Guy C. Emerson, 3 Agassiz Park, Jamaica Plain, Mass.; Cassius M. Foster, Burt Lake, Mich.; Charles Neave, "Madeley," Ossining, N. Y.; Samuel Storow, 3122 Lake Hollywood Drive, Los Angeles, Calif.; and Gardner T. Voorhees, Engineers Club, 32 West 40th Street, New York City.—GEORGE A. PACKARD, *Acting Secretary*, 50 Congress Street, Boston, Mass.

1892

Logan Feland, major general (retired), United States Marines, died at his home at Columbus, Ohio, July 18, according to a clipping from the *Chicago American* received from Abner Pollard. The current

issue of "Who's Who in America" affords the following information regarding Feland's career: captain commanding company F, 3d Kentucky Infantry, in the Spanish-American War, 1898; appointed 1st lieutenant, United States Marine Corps, 1899, captain, 1903; major, 1916; lieutenant colonel, 1917; colonel, 1918; brigadier general, 1920; major general since 1929, until retirement in 1933.

He served in Cuba, the Philippines, Panama, Santo Domingo, and various periods at sea. He arrived in France, June 13, 1917. Awards and medals received by him included Distinguished Service Cross, Distinguished Service Medal, six awards of the *Croix de guerre*, among them one with bronze star, two with palm, and one with gold star. He was made officer of the Legion of Honor, was awarded the Navy Distinguished Service Medal, and cited six times in divisional orders for gallantry. General Feland commanded the American forces on shore in Nicaragua in 1927 to 1929. What a career to follow the B.S. degree in architecture! What a man!

Fred Boyd Richardson, one of the best known officials of the town, died on June 28 at his Brookline home. He began work for an engineering firm and about 1898 was appointed assistant superintendent of the Brookline Highway Department, serving in that post until 1928 when he was elected town clerk, holding that office until his death. Richardson was an ardent Mason, vice-president of the Brookline Kiwanis Club, and a past president of the Massachusetts Highway Association.

Hutchinson reports meeting several of our members recently as follows: Lunching one day in the cafeteria in the basement of the Chamber of Commerce building, he discovered Charlie Nutter and had an interesting half hour with him. The very next day, he met H. L. Johnson in the same place and had a pleasant and relaxing session. Nutter finds the foundry business in iron and brass castings very good; Johnson sees improvement in the printing business. Nutter is in fine health; Johnson has only just recovered from a severe breakdown. Hutchinson met and spent an evening with Ralph Sweetser in New York in September. He has been engaged for a year past as secretary in charge of membership recruiting for the American Institute of Mining and Metallurgical Engineers, wherein he made a splendid record. He has now resumed consulting practice in iron and blast furnace work at 17 Battery Place, New York City. He reports that his business is back to normal.

Mr. and Mrs. William Robert Kales announced the marriage of their daughter, Ellen Davis, to Hugo Gustav Huetig, Jr., Saturday, June 27, at St. Paul's Cathedral, Detroit, Mich. Wayne University, Detroit, at its eighth annual commencement exercises, Thursday, June 18, bestowed on Kales the honorary degree of doctor of laws.

Arthur M. Worthington, outstanding physician of Dedham, Mass., gave an address on the history of that town at the concluding exercises of the Tercentenary

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Celebration. Moreover, Worthington was chairman of the general committee on the Tercentenary and his picture, along with other notables, appeared in the Boston newspapers.

The Class was represented at the Alumni Dinner, Symphony Hall, on June 8 by the following: Carlson, Fuller, Hall, Heywood, Hutchinson, Kales, and Park. You may be interested to know that there are two members of the Class serving on the Corporation — Carlson and Kales; three on the Faculty — Fuller, Hutchinson, and Ross Tucker; and two professors emeriti — Johnston and Park.

Our Class President and Mrs. Kales most generously invite the Class to celebrate the 45th anniversary of its graduation at their summer home in Harwichport on Cape Cod in June, 1937. Kales thinks there are enough beds for every one, but, if there is an overflow, he points out that accommodations can be arranged at the Snow Inn. "Make your plans to come to the Cape to meet again your old classmates and to have a good time. Details of arrangements will be communicated later. With best wishes to all. (signed) Billy Kales." Those who enjoyed their splendid hospitality in 1927 will know the kind of time to expect. — JOHN W. HALL, *Secretary*, 8 Hillside Street, Roxbury, Mass. W. SPENCER HUTCHINSON, *Assistant Secretary*, Room 6-201, M.I.T., Cambridge, Mass.

1894

Early in September Warren Jenney was married in King's Chapel, Boston, to Miss Louise Brown, daughter of the late Howard W. Brown, who was for many years the minister of King's Chapel. Among the ushers was Stoddard Jenney, son by his first wife who died in 1928. I am sure the very best wishes of the whole Class are extended to Jenney and the hope that he will enjoy many years of happiness. Mr. and Mrs. Jenney will make their home in Weston where Jenney has lived for many years. It happens that on the day preceding this event he dropped into my office, but did not notify me at that time of the great event which was impending.

The Secretary and Ray Price have had a lifelong friendship beginning with freshman year. In the more than two score years since graduation, our meetings have been relatively few, but one of those rare occasions came a few weeks ago when Price and his wife were spending a few days in the Boston region, and it was our pleasure to have them as guests for dinner and for an evening at home. Mr. and Mrs. Price recounted for our benefit the experiences of a recent tour by air throughout South America, the whole trip extending over nine months. During this period they flew from California to Mexico, thence to the west coast of South America, down the coast to Cape Horn, back to Valparaiso and over the Andes to Buenos Aires, then to Rio de Janeiro, and then back to North America. In Buenos Aires and some of the other places they made extended stays, and Price was able to observe the business and social condi-

tions in our sister continent. For many years he has been specially interested in studying the spread of the doctrines of communism, and on this matter he is especially informed and could, if he chose to do so, write a most interesting and thrilling story on what he has actually seen, heard, and learned in his travels, which have now covered at least four of the six great continents. It is Price's belief that we are not awake to the situation which exists and that it is very important for us to inform ourselves much more thoroughly as to the spread of doctrines which are counter to the principles under which our own country was established and has developed.

Professor George Haven, after more than 40 years on the instructing staff at the Institute has now become a professor emeritus and will spend the years of his well-earned retirement at his country home in New Hampshire. I am sure he would be glad to hear from any of the old boys who choose to write to him at Box 84, Laconia, N. H.

After several years the Secretary has received word through the Alumni Office of Frank Maxwell, formerly of Jacksonville, but who now gives the address as Maxwell Grove, Melrose, Fla. — A new street address has been received for A. S. Rogers which is 5214 Cass Street, Omaha, Neb. — D. S. Unruh also sends in a new address, Covina, Los Angeles County, Calif. — C. A. Hamblet, who for many years has been located in Lowell, Mass., now sends in as his address Newport and Gap Pike, Cranston Heights, R. D. No. 1, Wilmington, Del. — Another man who has been lost for many years has once more been found: W. S. Hulse was carried on the Secretary's book as Berlin, Germany. When in Berlin last year the Secretary tried to locate him, but vainly.

In response to a letter to members of the Class, the Secretary has a number of interesting replies: F. M. Mann is an emeritus professor of architecture at the University of Minnesota, having retired from active work in 1936. One of his daughters is a student in architecture at Minnesota. Mann is going to California to spend the winter and will possibly run across some '94 men there. Fishing and photography are his favorite forms of relaxation.

Leonard Tufts still lives the greater part of the year at Pinehurst, N. C., although he has retired from active management of his properties there. His three sons are now in charge of the businesses which were started by Leonard's father but have been greatly developed by Leonard himself. He spends some of his summers at Meredith, N. H., and when at Pinehurst manages to keep busy by running a dairy, working in his shop, and studying genetics. He says he used to write checks but has gotten out of the habit in the past six years. — Tom Curtis is still active as vice-president of the Lord Electric Company in Boston. Tom says he has not had a single day in bed for 43 years, which is some record. One of his sons is in the banking business and another is an importer. Tom likes golf and

bridge and his past literary labors consist of one article on the Olympic games for *The Sportsman*.

Theodore Varney, who was for many years with the Aluminum Company of America in Pittsburgh, is now the consulting engineer of the Aluminium Ltd., 1000 Dominion Square Building, Montreal, Canada. Ted spends his summers at Nantucket, Mass., and for relaxation plays golf and curses the New Deal. He has been a voluminous writer of reports and articles and sent me three of recent date on "Rural Line Construction," "Vibration in Overhead Conductors," and "The Evolution of the Modern Transmission Line." Although Ted's modesty caused him to request withholding the fact from publication, I am sure the Class will be proud to know that one of his papers won the Overseas Premium of the Institution of Electrical Engineers of London for the year 1935-1936. — Alan Clafin, who is still engaged as a manufacturers' agent and merchant in dyestuffs and chemicals, says he is not positively active but is on the job between week-ends and vacations. He admits to having seven extraordinarily intelligent and very handsome grandchildren. He has two sons who are bankers and a daughter who is a sculptress, a mother and housewife, and teaches school and lectures incidentally. Claf says she evidently has inherited her father's industry (ha! ha!).

Miss Louisa Wells, who lives on Memorial Drive in Cambridge, reports that she finds relaxation in counting the Institute sailboats on the Charles. — Newbegin is chief engineer of the Bangor and Aroostook Railroad, although he states he is very much unemployed at present. The Bangor and Aroostook does not go to Quoddy. — W. C. Peet is one of our busiest members, having retired from Peet and Powers, Inc., in New York City and now spending his time as chairman of the board of the Rye Trust Company, president of the United Hospital at Port Chester, and also president of the Rye Public Library at Rye, N. Y., as well as a few other jobs that Peet says do not pay. His five children are all in active business or scientific careers or are still engaged as students — one at the Harvard Law School and one at Vassar. One of his daughters is at the Rockefeller Institute for Medical Research. Peet reports a trip to the tropics during the past year, covering Cuba, Jamaica, Panama, and two months in Costa Rica. His home is at 290 Grace Church Street, Rye, N. Y.

Jim Kimberly and his wife are now living at the Shoreham in Washington, although they spend their summers at Neenah, Wis., and have a winter home in Tryon, N. C. Jim retired from business a few years ago, but any one who knows him would understand that he may be retired but not inactive. — F. S. Howland is still carrying on the business of Howland and Son at Athens, N. Y., in which he has been engaged since graduation. His son, who is also a graduate of the Institute, is associate professor at Purdue, while his daughter, who is a

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Ph.D., is engaged in cancer research at the Franklin Institute, Philadelphia, Pa. — Dan Richards is still the signal engineer of the Norfolk and Western Railway Company and lives in Salem, Va., although his business address is Roanoke. He is still very active in his job and as a relaxation says he loses money running a dairy farm. He has a son in the teaching profession.

George Leiper is another one of our busy retired fellows. Within the last year or so he has traveled to Bermuda, the West Indies, and South America. His home is "Westleigh," Norwood Avenue, Chestnut Hill, Philadelphia, Pa. — And here is what Jack Wray says: "Sports editor, St. Louis *Post-Dispatch* — am going strong." He has recently traveled to Europe, Mexico, and various sectors of the United States. He writes constantly for newspapers and magazines. His output is, as he says, nearly a million words a year. Wray lives at 4605 Lindell Boulevard, St. Louis, Mo. — Oscar Couch writes from Harlingen, Texas, that he is engineer inspector for the United States Bureau of Reclamation. — C. B. Beach still lives in Dubuque, Iowa, at 285 Alpine Street. He has three daughters, one of whom is a student Young Women's Christian Association secretary at Washington State College, Pullman; one in Young Women's Christian Association work in Hilo, Hawaii; and one a secretary at the State Hospital at Iowa City.

L. S. Greenleaf is secretary of the Behr-Manning Corporation of Troy, N. Y., president of the Embossing Company of Albany, president of the Albany Community Chest, president of the Albany Medical College, treasurer of the Albany Hospital, trustee of the Albany Savings Bank, one of the governors of Union University, and secretary or treasurer of some half-dozen minor organizations. This doesn't seem to fill up his time, so he travels a little and says that "when thoroughly confused like F. D. R. I go fishing." — Arthur LaMotte is president of the explosives section of the du Pont Company. Even back in freshman year he was interested in explosives. He has written numerous articles, books, and reports on the subject and given many lectures. His address is 5060 DuPont Building, Wilmington, Del. — Earl Jenckes is receiver for the Fairy Silk Mills at Shillington, Pa., and lives at Wyomissing. His son is manager of the Joseph Bancroft and Sons Company of Pennsylvania.

L. R. Moore is director of gas, electric, and water utilities in the Department of Public Utilities of Massachusetts and continues to reside in Concord, Mass. — Ned Hunt is the efficient commissioner of public works and city engineering of Portland, Maine. He can generally be found at City Hall except when he can sneak away for a little fishing and hunting. He is an expert on snow handling and street cleaning. — R. S. Weston of Weston and Sampson, 14 Beacon Street, admits he is trying to survive after several PWA jobs.

W. H. Bovey was not content with running the Washburn Crosby business for many years, and is now president of

Dunwoody Institute in Minneapolis. His son, also a graduate of M.I.T. (1922), is president of the Cannon Valley Milling Company. Bovey has taken great interest in astronomy in the last few years and has made a serious study of the subject and frequently gives lectures thereon. — H. A. Cray is still in active business and is now president of the Pennsylvania Furnace and Iron Company in his old home town of Warren, Pa. — H. E. Hewitt is senior partner of Hewitt, Emerson, and Gregg, architects in Peoria, Ill. — Mr. and Mrs. Darragh deLancey of Waterbury, Conn., announced the marriage of their younger daughter Anna to Mr. Charles S. Mears on June 20. Mrs. deLancey is one of our real globe-trotters, but has not made any extended excursions during the past year. — Of 35 men reporting their political preferences, 32 were for Landon and three for Roosevelt; Lemke, O'Brien, and Browder do not get a look-in. — SAMUEL C. PRESCOTT, *Secretary*, Room 10-405, M.I.T., Cambridge, Mass.

1895

John J. Colvin Wolfe died on Sunday, September 20, at the Charlotte Hungerford Hospital, Torrington, Conn. John was at his summer home in Warren, Conn., where he suffered a heart attack on Labor Day and was removed to the hospital in Torrington. Services were held at his home 273 Wardwell Avenue, Westerleigh, Long Island, September 23. Burial was the following day in the Moravian Cemetery, New Dorp, Long Island.

Johnny Wolfe was born in November, 1872, in Coeymans, N. Y.; was graduated from Technology, Class of 1895; married in 1902 to Laura Merrick Guyol. Following graduation he worked on engineering projects in Vermont; Chicago, Ill.; Cripple Creek, Colo.; Johnstown, Pittsburgh, Scranton, and Pottsville, Pa.; and in New Orleans, La. For many years he served as chief engineer of the New York City Health Department. — In his freshman year John was an ardent soldier. During the World War he served as captain in the 104th Regiment of Engineers. Quoting from one of his letters: "I lived through six months of . . . service in France, spent six weeks in the front-line trenches, and knew the joys of hot coffee and the sorrows of 'cooties'."

His engineering and social connections included the American Society of Civil Engineers, Municipal Engineers of New York City, Veterans of Foreign Wars, The Technology Club of New York, the Westerleigh Improvement Association, and the Lake Waramony Country Club. — Surviving him are: his wife, Laura Guyol Wolfe, a columnist for the *Brooklyn Eagle*; Dr. John Colvin Wolfe, Jr.; Mrs. Charles Le Mieux; Lawton Burroughs Wolfe; Miss Anna Laura Wolfe; Lawrence Guyol Wolfe. — Johnny was a droll, sincere little fellow with a big heart full of love and service to many. He loved his family much; he loved his classmates as well. He was faithful in all things and we will miss him, especially at our class reunions.

William H. Winkley retires. We quote from the *Standard Insurance Weekly* of Boston: "William H. Winkley, manager of the Boston Board of Fire Underwriters, has retired from that position as of September 30. Isaac Osgood, '00, now assistant manager of that organization, will assume the duties of manager on that date by action of the Board's executive committee this week and with the approval of the advisory committee. These managerial changes will come before the October 13 meeting of the Board membership for approval. Mr. Winkley has served the Board as manager for the past 15 years, having succeeded H. Belden Sly, now Secretary of the Eastern Underwriters Association, in April, 1921. The period of his managership has been an active one, during which he has competently handled his duties."

"He was born in Somerville, Mass., in 1872. He was graduated from Technology in 1895, with a degree in naval engineering, and shortly after his graduation began his insurance career as a special agent of the Hartford Fire Insurance Company in the New England field. From 1907 until he accepted the position from which he now retires, he was special agent of The Insurance Company of North America. Mr. Winkley served the New England Insurance Exchange as president for nearly three years, being chosen in April, 1919, to complete the unexpired term of the late Frank N. Battilana and being reelected for a two-year term in 1920. He also served the Exchange as vice-president and as a member of various committees, including executive, railroad, and schedule rates committee."

Just a line to Fred Cutter of New York: Anyway Fred — we all wish you joy and happiness. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

1896

[After these notes were written, Mrs. Rockwell, who had been ill for some time, passed away in Cambridge on November 2. The presence of Ames, Callan, Damon, James Driscoll, Joseph Driscoll, Hultman, Locke, Tyler, and Underhill at the services on November 4 gave expression to the feeling of the entire Class for John in his loss. — Charles E. Locke.]

The death of Mortimer A. Sears occurred in Washington on October 6. — The Myron Fullers left on October 15 for a trip of six or eight months.

The Class should continue to take pride in the success of Hultman in resisting the grabs which, according to newspaper statements, have been aimed at some of the funds to be expended by the Metropolitan Commission, especially those funds for the new Quabbin reservoir. The whole story as told by the newspapers makes rather interesting reading and tells of the actual award of some contracts by other members of the Commission in Hultman's absence, and the successful defeat of these awards through the medium of the courts.

1896 Continued

Requests have been received for a story of the round-the-world tour of Jacobs and he has most graciously submitted the following report: "If you are interested in some phases of geology — volcanoes for instance — in geography, in things, and places; if wanderlust is still strong within you, refusing to yield to the lure of the cozy fireside corner or the veranda chair; if an indulgent university or other employer sees the value of sabbatical leave in the renewed vigor and in the first-hand information which it engenders; and if your Better Half can for a time break 'the ties that bind' (meaning 'contract' and the church sewing society), why by all means take a trip around the world, even though you strain your resources to do it. You may 'go broke' but you'll have wonderful memories all the rest of your life — and since before this New Deal is played out you'll all be broke anyhow, the 'broke' part doesn't much matter. Let it be here recorded that 75% of the world cruisers were actuated by this philosophy.

"Our *Drang nach Osten* began on the Italian liner *Roma* . . . just after a severe blizzard had swept across the ocean and continent and filled New York's streets with more snow than they had held for many years. So thoroughly had Boreas blown himself out that our voyage was calm and uneventful, and at daylight of the 2d of February Madeira peaks rose out of the ocean, and presently we were landing at Funchal and being conveyed to the railroad station in bullock-drawn sledges over streets paved with basaltic pebbles. Then up by train 3,000 feet among the old volcanic peaks, long since dead, and a sporting ride down to the town in wicker sleds guided by two expert pilots over a pebble-paved course. Glimpses *en route* of flower-covered villas and great fields of sugar cane and bananas, quaffs and purchases of fine old malmsey, strenuous bargaining with the natives for table linen, wickerwork, and the like, and we were off for the Mediterranean. In such summary fashion does the cruise ship dispose of many ports of call, causing bewildered passengers years later to wonder whether it was Madeira or Málaga that they had visited, although positive that the place did begin with an M!

"Some 33 hours at sea and then, while it was still dark, we entered the Pillars of Hercules, with the lights of Ceuta to starboard and the flashing beam of Gibraltar on the port bow. Dawn came on and with it the hugh bulk of the Rock took shape, while bugles blew the reveille and 'Gib' awoke to another day — and another cruise ship of 'rich' Americans to be separated from even their depreciated dollars, but to such excellent advantage in this fine port that a bottle of English Yardley's, costing you a dollar in New York, can here be had for merely two dollars!

"We landed in tenders at 8:00 A.M. and in a long line of motor cars proceeded to 'do' the place, geologically, historically, scenically, and commercially. Guides in the cars dwelt on the glories of the Moor-

ish occupation and talked glibly of the Wars of the Spanish Succession, while interjecting data regarding the Rock, pointing out the Neutral Ground, the 'prudential' face of Gibraltar, Europa Point, and so on. Walks up into the lower galleries of the fortress, through the five gates, and along the narrow, crowded streets, with the inevitable purchase of souvenirs (conversational foci for the folks back home), and Gibraltar was checked off our list, later of course to be studied carefully in the guide books for things you didn't see but must be prepared to talk about with the aforesaid F.B.H.

"Next morning we were running along the African coast with its high Atlas and their snowy peaks, for this was a cold winter and snow fell even on the borders of the Sahara. Coastal settlements began to appear and gradually became continuous when, rounding a cape, we saw the great city of Algiers, with its white and yellow buildings capped with red tile roofs, mosque minarets here and there, and a great memorial shaft crowning a hill, all glistening in the brilliant sunshine. Back of the city rose the serrated mountain peaks, while at the shore great moles formed a small harbor.

"A few hours on shore, spent to the best advantage in automobiles accompanied by polylingual guides, enabled us to see the fine city which the French have built during the past hundred years, with its motley crowds of French, Arabs, Spaniards, and what have you, all apparently living in harmony, though there had been a flare-up a month before between Moslem and Jew. Interesting visits to Catholic cathedral and Mohammedan mosque, unforgettable walks in the filthy Arab quarters, fine views from the old citadel, a delightful stroll in the botanical gardens, and inevitably some time in the bazaars — trust our subsidized guides for that — and again we were off, this time for 'sunny' Italy, with snow on Vesuvius and rain ever in the offing.

"At Naples we left regretfully the gallant *Roma*, with her kindly officers and smiling attendants, to continue on their honeybeelike flight around the Mediterranean while we went on our own. Days followed at Pompeii and Ercolano, guide book in hand and Bulwer-Lytton's 'Last Days' in the recesses of our minds, seeing, photographing, listening to our guide's explanations of the age-old tragedy, while in the background, calm and serene, rose the great volcano, the author of it all. And, joy of joys, on this February day in 1935, Vesuvius was in eruption. For years we had tried to see this most spectacular of geologic phenomena, had crossed the Pacific to Hawaii only to have Mauna Loa erupt after we had reached the mainland, and had stubbornly returned to the islands only to find that the eruption had been short-lived and the volcano again *pou*, which means dead.

"But in Naples at last we had caught up with lava in motion. For hours we stood on the floor of the crater which,

two weeks before, had been a cauldron of boiling lava, now crusted over but showing angry red in the cracks. Shoes grew hot and film-pack tabs caught fire. The crater was full of mist and, near at hand, crashes were heard like waves beating on a shore. Presently the fog rolled away and we saw an inner cone belching sulphur-colored fume which rose like the pine tree to which Pliny saw a resemblance in the great eruption of 79. The fog rolled in and the volcanic drama was over. A visit followed to the volcanologist, Dr. Maladra, in his observatory perched high on the flank of Vesuvius. Questions and answers in English, Italian, French, German (one in the last named brought the instant response 'I am an Aryan, but I spik no German') as best suited one's vocabulary, filled pages of notes and added to our volcanic lore. An interesting visit to the new *solfatara* at Puzzuoli, and an attempt, frustrated by heavy rain, to take the Amalfi-Paestum-Sorrento drive, together with the rising tide of expense accounts in this land of high prices, brought our Italian visit to a close.

"Still clad in winter garments and with a snow-capped Vesuvius challenging our photographic efforts, we departed on S.S. *Esperia* for lower latitudes and, we hoped, warmer weather. Egyptian days were warm and brilliant; Egyptian nights cold enough for warm blankets. The desert was blinding in the midday sun, and through it crept the thread of the Nile with its green border of growing things contrasting sharply with the white sands. On the desert edge we visited old Memphis with its Tomb of the Sacred Bulls and its Step Pyramid; on another edge we gazed at the great pyramids of Cheops; across the way the modern Nena House with its cool shade and European *cuisine* — typical of this land of the very old and very new. In Cairo with its broad modern streets and fine buildings were the Egyptian Museum thronged with visitors intent on seeing the exhibits from Tutankhamen's tomb; the Citadel, key to the possession of Cairo till Napoleon's guns reduced it; mosques of the old rulers; bazaars full of unwanted things at (to the dealers) much wanted prices; hordes of fez-covered Egyptians, turban-draped Arabs, veiled women, and everywhere dirty urchins and unclean grown-ups frenziedly demanding baksheesh. A former colleague at Vermont was working on worm diseases of the Egyptians under a subsidy from the Rockefeller Foundation, and together we visited native villages down towards the Barrage Dam, finding ample cause for the disease and wondering how a people could long exist under such appallingly unsanitary conditions.

"Again high prices and the inexorable itinerary curbed our desires to see more of the Nile valley with its ancient temples and modern dams, so reluctantly we entrained for Port Said and there boarded our third boat, the express steamer from Trieste to Shanghai, the S.S. *Conte Rosso*, which was to connect with the S.S. *Empress of Britain* at Singapore, two weeks later. On the *Conte* we voyaged interestingly through 90 miles of the Suez Canal

1896 Continued

under the light of a full moon which made the desert into a thing of ethereal beauty; across the Red Sea, cool and comfortable at this time of year, with great 10,000-foot mountains to starboard and the lofty Mount Sinai Peninsula to port; past many volcanic islands active only recently, and across the Arabian Sea to Bombay. The few hours here were negligible for we were going to catch the *Empress*, who had given her passengers a week or ten days in India. And finally on March 3, just after we had docked at Singapore, she arrived, dwarfing all around her by her great size and looking truly regal in her white paint and fine proportions. We said good-bye to the Lloyd Triestino Line which had brought us safely and pleasantly from New York and were soon luxuriously quartered on this greatest of round-the-world cruisers. *To be continued.* — CHARLES E. LOCKE, Secretary, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, Assistant Secretary, 24 Garden Street, Cambridge, Mass.

1898

We recently received a post card mailed by Lester Gardner on the dirigible *Hindenburg* over mid-Atlantic. A little later we received a long account, multigraphed for his friends, of the sensations of a transatlantic trip in an airliner. Lester is very enthusiastic concerning the comforts and safety of air travel. He started in weather so bad that all airplanes were grounded and he went through the severe storm in which passengers on the S. S. *Europa* were injured. There follows a dispatch from Moscow (October 5) to the New York Times of Tuesday, October 6: "Major Lester D. Gardner arrived in Moscow at 11:18 this morning, having embarked on the dirigible *Hindenburg* at 11:17 Wednesday night. He completed a journey of more than 5,000 miles by commercial air lines in 68 hours, 52 minutes flying time. . . . Major Gardner will inspect the Central Aviation Institute, where Soviet planes are designed, on Wednesday and will fly back to Berlin Thursday for an aeronautical meeting there.

"Major Lester D. Gardner, organizer and secretary of the Institute of the Aeronautical Sciences, will be the guest in Germany of the Lillienthal Society, the new coördinated technical clearing house of German aviation. . . . Major Gardner will also visit technical and military air organizations in France and Germany.

Roger Babson is always very much in the public eye, so much so that we take it for granted and do not always quote him in these columns. Recently he made some rather startling utterances at the annual convocation at the Babson Institute which we have all doubtless read in the daily papers. We will, however, quote the final paragraph of a recent talk given at Harvard, because it is rather typical of the way Roger thinks: "Of course, in the last analysis, only a spiritual revival will save any nation. In the great emergencies ahead, courage will be our only real

security; while courage comes only through faith, self-control, and an equal interest in others. Hence, I believe that we must depend upon churches, schools, and parental instructions to give our communities effective protection. On the other hand, I like to group these different forms of needed protection under three heads above outlined and thereby refer to 'my three goals': (1) The goal where every life in every community will receive complete and equal protection; (2) The goal where every job in every community will have effective and equal protection; (3) The goal where the surplus energy and intelligence of previous generations existing as so-called 'investments' will be protected and will serve our communities in worth-while ways. These are the three goals which appeal to every civic-minded statistician. To help our cities reach these goals, an alumnus of the M.I.T. humbly appeals to the Alumni of Harvard University."

We report with sorrow the following deaths in our Class: Finlay F. Ferguson, Peeble and Ferguson, 733 Law Building, Norfolk, Va., October 7; Worthington Cornell, Stone and Webster, 49 Federal Street, Boston, Mass., September 29; Joseph L. Mara, March 13, 1932. — ARTHUR A. BLANCHARD, Secretary, Room 4-154, M.I.T., Cambridge, Mass.

1900

A deserving appeal for funds for the coming year has been received from the Athletic Association of the Institute and if any of the members of this Class care to contribute, the Secretary will see that the donations are forwarded. Ralph Jope '28 is doing such a wonderful job as secretary of the Athletic Council, it seems that a material evidence of approval from this Class is in order.

Hal Jouett writes that his work on the Cleveland Terminal is completed. He returned to New York City, November 1, resuming his connection with the New York Central in the office of the vice-president. He expects to be able to attend some of the class dinners now that he is nearer. It will be nice to see Hal more often and to get him to tell of some of his experiences on his 14-year job as a terminal builder.

Mr. and Mrs. Elbert Grover Allen announce the marriage of their daughter, Sylvia Mae, to Dr. Clifford Charles Wernham on Saturday, October 17, at West Newton, Mass. — This summer Tom Perry severed his connection with Plywood, Inc., of New Albany, Ind., and has become associated with The Resinous Products and Chemical Company of Philadelphia, Pa. In his new position Perry, who is regarded as a national authority in the engineering problems of plywood manufacture, will devote himself largely to the development of new wood adhesives.

Seen or heard from lately: Bowditch, Gibbs, Russell, Batcheller, Bugbee, Burns, Richardson, Draper, Howe, McCrudden, Ziegler, and Walworth. — C. BURTON COTTING, Secretary, 111 Devonshire Street, Boston, Mass.

1901

The Alumni office occasionally releases a bit of interesting news regarding Alumni who are too modest to do their own broadcasting, and my limited experience as Secretary already indicates that there is much modesty in including any personal comments on the class data sheets. In this particular instance the news relates to Professor Taft, who so ably represents our Class on the M.I.T. Faculty, and it is to the effect that Ted's parents have recently celebrated their 59th wedding anniversary. It would, therefore, appear that if Ted follows their good example, he has still many years ahead of him and perhaps some day we may be enabled to induce him to try his hand at the interesting job of class secretary.

I have also heard from Professor Locke '96, Alumni Secretary, to the effect that almost every other Class has an assistant secretary and that '01 should follow suit, particularly in view of the fact that our President, Lammot duPont, our Vice-president, Joe Evans, and your Secretary live at some distance from Boston. To make a long story short, therefore, it is a pleasure to report now that Willard Dow has consented to act as assistant secretary (at least until the next regular election of the Class) and I am sure that he will always be delighted to have any of the men look him up at 20 Beacon Street, Boston, Mass., whenever they are in Boston.

In the November Review mention was made of the sudden death of Loring Danforth. I have now received a letter from Nat Patch, Secretary and Advertising Manager of the Lumen Bearing Company of Buffalo, N. Y., and to amplify previous comments do now quote from his letter as follows: "We were all greatly shocked to hear of Loring's passing, particularly as the doctors reported his health in fairly good shape and the day he died the doctor told him he might play a few holes of golf without any harm. He did so and when he came home he told his wife he was going to lie down; he felt a little tired. She thought he looked white so she followed him to the bedside and as he sat down on the bed he fell over and was dead. Whether the golf was too much or not, no one will ever know, of course. It was a sad fact that his family were absent, all four children having been away, and his wife being the only person with him. . . .

"Loring had been sick for six or eight months and possibly you know or others have told you more about that sickness than I know, for I know very little except that the rumor was that he had suffered one stroke while in Florida. He is very greatly missed here. He was very active in many things and was always one that could fill in the gap with credit and tact so that he was constantly being called upon and was always one who made good by answering such calls effectively. In his church and in the chamber of commerce and other places of importance here in the city, his prominent

1901 Continued

work will long be remembered. He was president of two of the social clubs, the University and the Buffalo Athletic, during his lifetime, and served as president of the Buffalo Chamber of Commerce. There are a great many other activities in which he was very prominent, and we can take a certain satisfaction in the very successful way in which he conducted all of these affairs."

Nat Patch also wrote me of his own personal affliction, his eyesight having been gradually failing, although I am glad to advise that his letter indicated that he was hopeful of making a considerable recovery; all his reading at the present time, however, has to be done by his secretary. Nat says that although he was very disappointed that he could not attend the 35th reunion he is already looking forward to the 40th. He hopes to be present at that time, favored by a considerable return of his eyesight.

Three of the annual letters brought replies telling of the sad passing of more of our classmates. One was from Mrs. Rossmassler stating that her husband, Carl, who was graduated in the Course of Naval Architecture and Marine Engineering, died of a heart attack on December 28, 1935. Carl had been connected with Cooper Union, New York, and I know that his death was entirely unexpected. He will be greatly missed at Cooper Union and by those of us who used to know him so well in Course XIII.

Ralph Robinson, who is manufacturing engineer in charge of the vacuum tube department of the General Electric Company at Schenectady, writes as follows regarding Tom Lunan: "Just before Allan Rowe died I sent him a notice that Thomas M. Lunan died last year at Malden, Mass. Apparently this letter was mislaid: Lunan's name was on the list of addresses wanted. He was very unfortunate in his life. He had either spinal meningitis or locomotor ataxia, I have forgotten which, and was a cripple for many years. He had a family of two boys and they had a very tough time because of financial difficulties. I know nothing further about them." That would evidently indicate that Tom died some time during 1934, but as far as I know, no previous notice has been included in the class notes.

Warren F. Blecker's former secretary returned the class data sheet stating that Warren died on June 13 of this year and that he was buried at Boulder, Colo. Warren was a Course V man, and for a number of years, I understand, owned and conducted a special research laboratory at Tulsa, Okla. — Too many of the Class have already had their numbers called and we will hope that it will be some time before more names will have to be added to the record. — ROGER W. WIGHT, *Secretary*, 700 Main Street, Hartford, Conn. WILLARD W. DOW, *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

1902

In the last issue of *The Review* we stated that plans were underway for our 35th reunion next June. These have now

taken concrete form as follows: The dates are June 11 to 13 and the place is Oyster Harbors on Cape Cod. This is on Osterville Great Island just across the bay from Osterville where our 15th was held. This resort has golf, tennis, bathing, sailing, and everything to make the heart of the reunionist happy. As our 30th had to be cancelled on account of the depression, this is the first reunion in ten years and a large attendance is looked for. Save the dates and make your plans to be on hand. A preliminary announcement is in preparation and may reach the classmates before this issue of *The Review*. The full committee (the list last month was not complete) includes: Adrian Sawyer, chairman; Cates, Fruit, Hunter, Kellogg, Lockett, Millar, Jason Mixer, Montgomery, Moore, Burt Philbrick, Place, Proctor, and Reynolds.

Elizabeth Friend, daughter of our classmate, Alfred W. Friend of Winchester, Mass., was married on June 27 to Putnam Cilley '29. Her sister, Dorothy, who was married last December to J. B. Miller of Belmont, Mass., was matron-of-honor at the ceremony. Friend's other daughter, Alice, is Mrs. R. S. Ireland of Atlantic City, N. J. Friend and his daughter, Mrs. Miller, played in the "Fathers and Daughters" golf tournament for Massachusetts and while not landing a place came in above the average of the couples who competed.

Word has been received of the death, earlier this year, of our most distant classmate, Ethelbert Parker of Sydney, Australia. Parker had been associated with Warren Brothers Company of Boston for over 30 years, laying the Warrenite-Bitulithic Pavement. He was in charge for this firm in Asheville, N. C., then for several years in Baltimore, and after that for several years was general superintendent in Boston. About 15 years ago he went out to Australia and organized Australian Roads, Ltd., of which he was managing director. This company has built many roads of the Warrenite Pavement in Sydney, Melbourne, and other cities in that distant continent. Parker was married in 1903 to Miss Florence Louise Richmond. They had two daughters: Genelle and Lucy.

Word has also been received of the death of John Ripley Odell of Grosse Pointe Farms, Mich. A notice of Odell will be in the next issue of *The Review*. — FREDERICK H. HUNTER, *Secretary*, Box 11, West Roxbury, Mass. BURTON G. PHILBRICK, *Assistant Secretary*, 246 Stuart Street, Boston, Mass.

1904

Although this seems to be rather late to express such sentiments, I sincerely hope that all members of the Class had a very pleasant and happy summer, and that this issue of the notes may provide some information which otherwise they would not know. The first item will give a record of the participation of the Class in Alumni Day at the Institute on June 8. Strolling about the Great Court on that day I found: Hayward, Munster, Phinney, Roberts, E. H. Russell, Holcombe, Sos-

man, Mert Emerson, and Whitmore — which was a very good representation for the Class. Holcombe had been in rather poor health during the winter, but was on the road to recovery and came to the Institute to witness the graduation of his son, Marshall Maynard Holcombe of the Class of 1936.

After the exercises at the Institute we had a small gathering at the University Club, under the guidance of Gus Munster, in preparation for the formal dinner at Symphony Hall. At this affair Charles D. Young, Vice-president, Pennsylvania Railroad, was introduced by Gus and was unanimously elected by those present as an honorary member of the Class. Following this little gathering we went to Symphony Hall where our new honorary member was received by the toastmaster and escorted to a seat at the head table, an unusual honor for a member of this Class. During the course of the evening he arose and publicly announced his election as an honorary member of '04, which was highly gratifying to those of us who were present. He also made several visits to our table and, it might be said, was the life of the party during those moments. Present at Symphony Hall were: Roberts, E. H. Russell, Munster, Sosman, Hayward, Holcombe, and Emerson. I might add that I was present at all of the above-mentioned events.

The annual reunion of the Class was held as usual at East Bay Lodge, Osterville, Mass., on June 26, 27, and 28, starting with a luncheon at the University Club at noon on the 26th, following which we proceeded to the Cape by automobile as usual. There were no outstanding events to record during the time spent there, but all those who were present enjoyed it. We missed Mert Emerson and Holcombe, who were prevented from attending by pressure of business in other parts of the country, but we were very glad to welcome one who had not been to a reunion for some years: Joe Haraden of Schenectady. Joe sells Chevrolets and Bob Dennie sells Fords, and we were highly entertained by heated debates between them as to the relative merits of the cars. Those present at the reunion were: Munster, Haraden, Parker, Kendall, Galusha, Jack Draper, Fellows, Comstock, Ferris, Dennie, Sutton, and the always present Secretary.

Mert Emerson sent me a card reading as follows: "We wish to announce that the name of The Robert J. King Company, Inc., has been changed to King and Lang, Inc. In all other respects our set-up remains exactly as before." I am not familiar with the product of King and Lang, Inc., but if Currier Lang is associated with it, it must be good. Their business is located at South Norwalk, Conn. — Another item contributed by Mert Emerson indicates that Bernie Blum, chief engineer, Northern Pacific Railway, has entered upon a side line. During the summer he conducted a tour from Chicago to Portland, Ore., where the annual convention of the American Society of Civil Engineers was held. During the trip a visit was made to the

1904 Continued

Coulee Dam. From the prospectus furnished by Mert, Bernie's trip looked like a good one, but in as much as it was received by me long after the trip was over, I did not participate, for more than one reason.

I am indebted to Professor Locke '96 for the two following items: Freeman N. Bull, who has made his headquarters in Joplin, Mo., for many years, has had a lot to do with jigs, and this has led him rather far afield. For example, some years ago he spent two years in the Orient introducing the use of jigs on tin dredges. Later on he spent two years in Bolivia on tin dredges. More recently he has had to do with the jig equipment on the Bulolo gold dredges in New Guinea. His latest job has been work in California placing jigs both on gold dredges and in gold mills.

Carle R. Hayward spent the last week in September with 19 M.I.T. seniors visiting metallurgical plants in Pennsylvania, New Jersey, and Maryland. — Early in the fall Don Galusha was passing through Boston and called me on the telephone and we had a pleasant conversation, during which he informed me that he has joined the grandfather's club by virtue of the birth of Mary Elizabeth Tanguay. Don says that Mary looks like her grandfather, which may or may not be an asset to her.

On July 21 Earle L. Ovington, better known to us as Volts, died in Glendale, Calif., at the age of 56. He was a victim of a heart attack which resulted from a long series of major operations. He is survived by: his widow, Mrs. Adelaide Ovington; a son, Kester; a daughter, Audrey. In accordance with his expressed wishes, his body was cremated and his ashes scattered from an airplane.

Volts Ovington was probably the most colorful member of '04 and a brief account of some of the events in his life will be interesting: Soon after leaving the Institute he went to France where he entered the Bleriot Flying School at Pau. He returned to the United States in 1911 and on the return trip he met Miss Adelaide Alexander of Gungston Hall, Va. A romance developed which resulted in their marriage on arrival in this country. He brought with him a Bleriot monoplane and immediately started flying in various parts of the United States. In June, 1911, he made the first flight over Boston, during which he carried a message from Mayor Walker of Waltham to Mayor Fitzgerald of Boston, and this flight was witnessed by thousands of persons about Boston. The following September he went to Washington where he succeeded in convincing Postmaster General Hitchcock that mail could be transported by plane, and on September 23, 1911, he climbed into his trusty Bleriot in Garden City, L. I., and transported 10 pounds of mail to Mineola, L. I., a distance of eight miles. This air service was conducted for nine days and proved transportation of mail by plane to be feasible, and was the forerunner of the air-mail service of today. Ovington was appointed Air Mail Pilot Number 1

as a result of this venture. Later in the year of 1911 he won the first cross-country trip, consisting of a triangular flight from Boston to Nashua, N. H., thence to Providence, R. I., and back to Boston, a distance of 160 miles, which he accomplished in 186 minutes, 22½ seconds, and for which he received a prize of \$10,000.

Volts maintained his interest in aviation throughout the rest of his life, and celebrated the 20th anniversary of the first air-mail flight by carrying a sack of mail on the first leg of a transcontinental flight from Los Angeles to Tucson, Ariz. Aviation was not the only thing which interested Volts. At one time he went about the country giving electrical exhibitions at the various expositions, the high spot of which was the passing of a million volts through his body.

Upon his return from France he went to Newton, Mass., and while living there he went into the egg business in a big and scientific manner. In this connection, he arranged a scheme whereby an egg was dated upon its being laid by the producer, and developed many methods of mechanical feeding of hens. He also produced "Vitalait," a kind of milk surcharged with certain germs, the introduction of which into the human body was guaranteed to cure many ailments of the digestive tract. I may be wrong in this statement, but it was something of that sort. At any rate, it was a going business for some time, but he finally disposed of it. In later years, he went to California and was engaged in a land subdivision development in Santa Barbara.

These rambling notes give some idea of the things which Volts did, but to me the circumstance which reveals the dogged tenacity with which he followed an idea is best evidenced by something which occurred while he was an undergraduate. Those of us who remember him best will admit that Volts did not have the physique of an athlete, certainly not that of a runner. However, he became imbued with the idea that he wanted to be a high hurdler and so applied himself to that end with the result that before he left the Institute he established a high-hurdle record for the Tech Athletic Association, which stood for some years. I think no better illustration of his character can be given than that. — HENRY W. STEVENS, *Secretary*, 12 Garrison Street, Chestnut Hill, Mass. AMASA M. HOLCOMBE, *Assistant Secretary*, 8 Rosemary Street, Chevy Chase, Md.

1906

As scheduled, the 30th reunion was held at the Oyster Harbors Club on June 6 and 7 of this year. Although the 25th reunion exceeded this one in attendance figures, the 30th lived up to our usual standard and was thoroughly enjoyed by all those who were present. Sixteen members of the Class and their guests arrived on June 5. These included the following couples: the Darlings, Ginsburgs, Benhams, Wetterers, Deans, and Kidders; also, Herbert Ball, Bob Lyons, Dan Kelley, and Charles Wetterer, who had the distinction of being the only '06 son

present. The evening was spent in a pleasant chat about the open fire with a single bridge foursome composed of Henry Ginsburg and Mrs. Dean versus Henry Darling and Mrs. Kidder. With the usual conservatism of the class members most of those present retired at a very seasonable hour. However, the scheduled reminiscing party was held in Dan Kelley's room and reports are that it lasted well into the morning and was a complete success. Your reporter left at 1:00 A.M. and at that time it showed great possibilities. Saturday morning the golfers had their practice rounds and during the day new arrivals reported frequently. The couples who came on Saturday were: the Coes, Wights, E. S. Chase's, Blackwells, Kendalls, Taylors, and Philbricks; also, Andy Keleher, Ralph Clarke, and T. L. Hinkley. This brought the total attendance to 35, including guests. Saturday afternoon some of the members of the party enjoyed a sail from Falmouth while the others played golf, roamed about the grounds, or were content to relax amid the pleasant surroundings at the club.

The dinner was held on Saturday night and a number of the members of the Class attended the dinner only; they were: the W. G. Abbotts, Farwells, and Guernseys; also, Andy Kerr and Ned Rowe. The Abbotts were accompanied by their daughter, Andrea, who had the distinction of being the only daughter present. This brought the total attendance at the dinner to 42. After the dinner we all assembled in the Green Room at the club and listened to reports from absent members of the Class and enjoyed motion pictures of previous reunions shown by Henry Ginsburg and Ralph Clarke. Ralph also exhibited some of the high-speed motion pictures which had been taken at the Institute. The orderly course of the meeting was interrupted by Harold Coes who took the opportunity to present the Secretary with a golf bag and complete set of clubs. The recipient was too surprised to convey adequate thanks at that time, but at this writing (four months later) he would like to record officially his great appreciation of the gift. After the meeting the bridge foursome resumed their activities and some of the younger spirits of the crowd enjoyed dancing.

Sunday morning the class championship golf tournament was held, while the ladies indulged in a putting contest under the supervision of Andy Keleher. Bob Pinkham came down for the golf tournament, and another member of the Class, L. D. Smith, also made his appearance for a few hours that day. This brought the total attendance of members and guests to 45, including Jack Condon, a business associate of Dan Kelley's. Fourteen members of the Class and two guests participated in the golf tournament. The gross scores of the classmates ranged from 96 to 133. Prizes were awarded as follows: 1st gross to A. C. Taylor, 96; 2d gross to R. J. Lyons, 98; 1st net to R. S. Pinkham, 99-23-76; 2d net to H. J. Ball, 101-24-77; special awards were given E. S. Chase and young Charles Wetterer who

1906 Continued

outclassed the older players with a gross 86. The putting contest was won by Mrs. Kendall and Henry Ginsburg. Bridge awards went to Mrs. Dean and Henry Ginsburg. The special award for coming the longest distance was given to L. D. Smith. The latter deserved special consideration for he came all the way from Milwaukee and arrived in Boston too late to come to the reunion by train, so he taxied from Boston to Oyster Harbors, a distance of about 80 miles. Smith studied naval architecture at the Institute, then turned to medicine, and is now an orthopedic surgeon in Milwaukee, Wis.

As noted above, this account of the reunion is being written four months after the affair occurred and it is felt that these notes do not do justice to the pleasure which those who attended Oyster Harbors experienced. Each reunion seems to emphasize the class ties in a manner which can be appreciated only by those who attend such affairs, and our 30th was no exception. This suggests the subject of "Thirty Years After" with which all members of the Class should now be familiar. Readers will be interested to know that, in less than a month after the notice with regard to the proposed book was sent out, around 40 have signified their desire to purchase a copy. As explained in our preliminary notice, whether we proceed with the book or not depends upon the response. We are not in a position to devote much time or to go to much expense to follow up the request for information. Will those of you who have not already sent in your replies please assist by responding at an early date. The Secretary has derived much pleasure from reading the biographies already submitted. If we can have enough of these I know classmates will be greatly interested in a book composed of this material. It is sincerely hoped that sufficient interest is shown so that we can go ahead with the proposed volume.

The *Foundry Trade Journal* of London included the following notice: "Mr. James L. Wick, President and General Manager, Falcon Bronze Company, Youngstown, Ohio, was elected president of the American Foundrymen's Association at the annual business meeting on May 7. This honor comes to Mr. Wick after a long career of distinguished service to the foundry industry and in the affairs of the American Foundrymen's Association. For many years he has been active in the cost work of the association and has taken an active part in the affairs of the Non-Ferrous Division. Prior to his election to the presidency, he was vice-president and chairman of the Divisional Activities Correlation Committee. Born in Youngstown, Ohio, in 1883, Mr. Wick's career has been centered in that city. He attended Rayen School there and received his higher education at M.I.T., from which he was graduated with a bachelor of science degree in mechanical engineering. Following graduation, he served as assistant to the general master mechanic, Youngstown Sheet and Tube Company, Youngstown, in 1906 and 1907, and as assistant to the chief engineer in 1907 and

1908. He resigned that position to serve as general manager, secretary-treasurer, to the Crystal Ice and Storage Company, Youngstown, with which he was associated until 1918. In that year he returned to the Youngstown Sheet and Tube Company, and the following year accepted a position as secretary and assistant general manager with the Falcon Bronze Company. He became vice-president and general manager in 1925 and was elected to his present position in 1929."

Secretary Locke '96 of the Alumni Association, who naturally follows Course III men, is responsible for the following items: Marden W. Hayward, who maintains an office at 810 Mills Building, El Paso, as consulting engineer and geologist for the American Metal Company, and John G. Barry, former chief engineer for the Howe Sound Company and former president of the College of Mines and Metallurgy at El Paso, who now maintains a consulting office at 808 Mills Building, El Paso, were both in Fairplay, Colo., in the early part of the summer doing consulting work for the Park Range Mining and Prospecting Company in connection with a lawsuit that Park Range had brought against the London Mines and Milling Company and the London Gold Mining Company. The litigation involves apex rights to a body of ore said to be worth a million dollars, which the plaintiff alleges that the defendant removed from within the side lines of its Iola claim.

Guy H. Ruggles has left Tooele, Utah, for Mountain City, Nev., where he is concentrator superintendent for the Mountain City Copper Company, the design of whose plant he worked on in New York last winter.

Henry S. Mears, who is now a consulting mining engineer with offices in the Studio Building, Portland, Ore., wrote an article on mining and milling costs for the issue of September 15 of the *Arizona Mining Journal*. A recent letter says that for four or five years he has been looking for a good mining property in which he could get an interest. Such things are hard to find, but he now believes that he has one. It has taken eight months to clear the titles, but the corporation has now been formed and awaits approval of the Securities Exchange Commission. As soon as that has been obtained work will be started. It is a gold property in the northeastern part of the state of Washington. — Fay W. Libbey, who has made his headquarters in Arizona for many years past, has decided that he has had enough of the Arizona temperature for a steady diet and has therefore moved his family to Portland, Ore., where his address is 2259 Everett Street, Northwest. This will be his permanent home, and he plans to spend much of his time there, going to Arizona only as his work may necessitate it.

Readers will be interested to know that the Class has inherited a legacy under the will of Lillie Collamore Smith whose passing was noted in this column some issues ago. One twentieth of her estate

went to the Alumni Association of the Institute to be expended for the benefit of the Class of 1906. It is estimated this will amount to about \$2,000. The Secretary will welcome any nonfacetious suggestions as to how the bequest might be used.

The following clipping is taken from the *Boston Evening Transcript* early last August: "Mr. and Mrs. William Jared Knapp of Rye and Millbrook, N. Y., have announced the engagement of their daughter, Miss Anne Allen Knapp, to Frederick G. Chapman, son of the Rev. Charles Frederick Chapman and Mrs. Chapman, of San Fernando, Calif. Miss Knapp attended the Shipley School in Bryn Mawr, Pa., and was graduated from Bryn Mawr College, later studying at the Sorbonne in Paris. She is a niece of Mr. and Mrs. Benjamin F. W. Russell (Sarah F. Knapp) of Brookline and Nantucket, and a cousin of Mrs. Whiting Willauer and Mrs. William S. Taylor, both of Dedham, and of Miss Isabel Russell, a *débutante* of the current season. Mr. Chapman studied architecture at the University of Southern California. He and Miss Knapp plan to be married in the fall, and will live in Santa Barbara."

Incidentally, we have received a note from Harold P. Hart '05, of Framingham, Mass., that he has a copy of our Senior Portfolio in good condition which he would be very glad to donate to anyone who would value it. This will be awarded to the first applicant.

The Secretary feels that he should report that the golf clubs are a source of great enjoyment in spite of the fact that the resulting improvement of his game has not been as great as he would like. A foursome was arranged including two of the classmates, namely, Ralph Patch and Bob Pinkham, at the Weston Country Club just a few weeks ago and it is thought that references to Messrs. Pinkham and Patch will confirm the statement that the clubs are working out very satisfactorily. — JAMES W. KIDDER, Secretary, Room 802, 50 Oliver Street, Boston, Mass. EDWARD B. ROWE, Assistant Secretary, 11 Cushing Road, Wellesley Hills, Mass.

1907

Once again we have to record the death of a classmate: Antoine G. Labbe died in Portland, Ore., on September 26. He entered the Institute at the beginning of our sophomore year, in the Mechanical Engineering Course, and was president of the Mechanical Engineering Society during our senior year. The Secretary well remembers the extreme accuracy and neatness with which he always executed his machine design, boiler and engineering drawings and reports. For many years he was president of the Willamette Iron and Steel Works. — A Portland (Ore.) paper of September 27 contains the following announcement: "Antoine G. Labbe, 55, prominent Portland manufacturer, died last night at the Erskine Wood summer home, seven miles east of Vancouver on the Evergreen highway, according to word received by Holman &

1907 Continued

Lutz, morticians, who were summoned to take charge of funeral arrangements.

"Death was unexpected, although Mr. Labbe was said to have been in poor health for some time. He was the last surviving son of three born to two of Portland's early day citizens, John and Angeline Mathiot Labbe. His brothers, C. Henri Labbe, consular agent of France in Portland for many years, and Dr. Edmond J. Labbe, prominent obstetrician, died within eight days early last year.

"Antoine Labbe was born in Portland, July 4, 1881. He was graduated with a bachelor of arts degree from Williams College in 1904 and with a bachelor of science degree in mechanical engineering from M.I.T. in 1907. In 1910 he married Winifred Loomis. To them were born two daughters: Elizabeth and Marguerite Louise. Mr. Labbe was a member of Phi Beta Kappa and Chi Psi fraternities, the University, Arlington, and Multnomah Amateur Athletic Clubs and Waverley Country Club. The Labbe home is at 2941 Northwest Quimby Street." — A letter of sympathy has been sent to Mrs. Labbe.

Early in October we received a letter from Sam Coupal, written on a letterhead that reads: "La Bajada Exploration, Engineering and Equipment Corporation, St. Louis," but Sam's address is Tip Top Mine, Black Canyon Road, Phoenix, Ariz. He has an interest in this property (silver mine) and they are opening up the mine seeking higher-grade ore. — Harold Wonson's son was graduated from Tabor Academy of Marion, Mass., last June and entered Dartmouth this fall. The boy has had a fine scholastic standing and also has done a great job in athletics. He won eight letters during three years at Tabor, in football, track, and baseball, and was captain of the baseball team in both his junior and senior years. He broke the 1,000-yard record at the preparatory-school meet at Harvard Stadium last March, besides taking second place in the 600-yard event. During July he attended the Citizens' Military Training Camp at Fort Adams, R. I., and at the end of the camp was awarded the prize for "the outstanding soldier athlete." On October 10, running on the Dartmouth freshman cross-country team, he took second place in their first meet. Harold's older daughter, Marcia, was graduated from Wheaton last June and is continuing musical studies this winter.

Alexander Macomber is directing the affairs of a gas-light company in Nantucket, Mass., and also one at Manchester, Mass. In addition he has an active interest in properties in Seattle and in Texas, so that every other month he flies to Seattle and stays for about ten days and on alternate months flies to Texas and follows a similar program there. How locally restricted this makes those of us feel who seldom go outside of New England!

Have you obeyed that impulse stirred by the request mailed by our Class Treasurer in October and sent in your contribution to our class treasury? And — remember our 30th reunion at Osterville,

Mass., Oyster Harbors Club, June 4 to 7. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WONSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1908

Edgar Williams has been appointed to the faculty of the Columbia University School of Architecture, named with others to be an associate in architecture in charge of instruction and design. — Tsok Kai Tse became vice-president and general manager of the Western District Power Company of Shanghai, China, on July 1. — We report with regret the death of Joseph K. Heydon.

We have the following changes of address to record: Maurice E. Allen, 406 West Woodruff Avenue, Toledo, Ohio; John C. Brooks, Park Drive and Laurel Street, Longmeadow, Mass.; Harry S. Chandler, 66 Baby Point Road, Toronto, Ontario; Clarence W. Clark, 225 Price Street, West Chester, Pa.; Martin P. de Veyra, Jr., Post Office Box 1149, Manila, P. I.; Dwight Dickinson, Jr., United States Naval Hospital, Philadelphia, Pa.; George W. Everett, Illinois State Planning Commission, 1516 South Wabash Avenue, Chicago, Ill.; William F. Grimes, 212 Coltart Avenue, Pittsburgh, Pa.; Julian H. H. Harwood, 824 43d Avenue, San Francisco, Calif.; Bradford B. Holmes, Pioneer Instrument Company, 754 Lexington Avenue, Brooklyn, N. Y.; Hugo F. Kuehne, 500 East 32d Street, Austin, Texas; Lynn A. Loomis, Eastman Kodak Company, 343 State Street, Rochester, N. Y.; George M. J. MacKay, American Cyanamid Company, Boston Post Road, Stamford, Conn.; Paul W. Norton, 1330 Statler Building, Boston, Mass.; Paul R. Powell, 205 Stony Run Lane, Baltimore, Md.; Joseph G. Reid, 7737 Colfax Avenue, Chicago, Ill.; Mateo Roco, Naga, Camarines Sur, Manila, P. I.; Harry P. Sweeny, Apartment 202, 4701 Connecticut Avenue, Northwest, Washington, D. C.; Clifford L. Wade, 2040 North 32d Street, Kansas City, Kansas; George D. Whittle, Bureau of Public Roads, Federal Office Building, San Francisco, Calif. — H. LESTON CARTER, *Secretary*, 185 Franklin Street, Boston, Mass.

1909

Mr. and Mrs. James H. Critchett have announced the engagement of their daughter, Ruth, to Russell L. Boyer, Jr., of Douglaston, N. Y. Miss Critchett was graduated from Mount Holyoke College and Mr. Boyer, from Cornell University. — Garnett Joslin, whose office is in Los Angeles, has recently been engaged in making an examination of the Emery Mine at Deer Lodge, Mont., and of some tin discoveries south of Albuquerque, N. M., and of the Golden Queen Mine at Mojave, Calif. Joslin is consulting engineer for the Pardners Mines Corporation, which owns the last named property.

Charlie Belden is still making publicity. The Danville, Va., *Register* carried a picture of two of Charlie's seven months' antelopes, recently carried by

plane from his ranch in Wyoming to Toby Wing at Hollywood. Miss Wing has named them Bernie and Winchell. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

In reading the October 17 issue of the *Saturday Evening Post* your Secretary was delighted to find the name of our classmate, E. J. W. Ragsdale. It seems that he is the experimental genius of the Edward G. Budd Manufacturing Company of Philadelphia, manufacturers and designers of railroad equipment. The Class has not heard very much of Ragsdale in the last 20 years and all classmates would like to hear further news of what he is doing.

It is understood that John Ahlers' son has entered the Institute this year and is taking a course in architectural engineering. — Your Secretary had the pleasure of calling upon Russ Wells in Pottstown, Pa., early in October. Russ was on the point of taking a vacation in the Pocono Hills and your Secretary accepted an invitation to follow Russ from Pottstown to his destination and spend the night there. Russ's sense of direction in Pennsylvania is worse than a stranger finding his way around the streets of Boston. It seemed as though there was not a town in the anthracite-coal district that he missed before reaching the end of his journey. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

1911

For the tenth time in the 11 years of its existence it was my pleasure and privilege to attend the Freshman Camp at Dunstable, Mass., the last week-end in September, and while there I found another 1911 son entering in the Class of 1940: Bruce Duffett of Niagara Falls, N. Y., son of Norm and Winona Duffett. He is interested in basket ball and tennis and has not decided on his engineering course yet. Also present as an advisor to the freshmen was Dick West '38, son of Bill West, II, of Chicago. Bill transferred from Purdue during the last college year and is taking engineering administration.

Ed Pugsley, VI, with Winchester Repeating Arms at New Haven, Conn., stopped off at Worcester, Mass., recently with Mrs. Pugsley en route to Exeter, N. H., where they were entering their son. That evening Ed spoke at a meeting at the Worcester Museum and told his auditors that he believed the time was coming when firearms would be museum pieces only. — Carl Ell, XI, Vice-president of Northeastern University in Boston, was reelected a sectional officer of the Society for the Promotion of Engineering Education at the organization's mid-October annual meeting in Burlington, Vt.

Fred Daniels' wife was elected president of the Worcester Camp Fire Girls, late in October. She is a prominent Smith College alumna, and she and Fred have a daughter who is a sophomore at Smith. — From

1911 Continued

the Alumni Office word comes that Stu Copeland, II, has left Bangor, Maine, where for years he has been an officer of the Eastern Manufacturing Company, and is now with the Northwest Paper Company at Cloquet, Minn. as president. — Also we learn from Alumni Secretary Charlie Locke '96 that Jim Greenan, III, manager of the southern division of Marsman and Company, Inc., has returned to Manila after spending a long vacation in the United States, and his present address is Reyes Building, Plaza Cerantes, Manila, P. I.

After reading the above 300-odd words you should immediately make a resolve to "write to Dennie before New Year's" and thus share in the work of keeping these class notes newswy. — ORVILLE B. DENISON, *Secretary*, Hotel Bancroft, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

It's so hard to raise any news from our classmates these days that we are forced to believe they are all busy once more speeding up the wheels of industry, and, we hope, making money for themselves. The few elusive items we have been able to scare up seem to confirm that idea. David Dasso, II, has been made a vice-president of the American Locomotive Company, in charge of the Diesel division. He is located in New York City, and will continue in an advisory capacity with Sulzer Brothers, Ltd., of Switzerland, whom he has represented here for several years. American Locomotive has taken over the license to manufacture in America under the Sulzer Brothers patents, so this seems to give us another classmate who has achieved a high-ranking position in American industry. — C. B. Vaughan, II, who has been associated with Dasso in New York, remains with the Sulzer organization and tells us that he expects to make a business trip to Europe this winter. — At this writing Bob Wiseman, VI, is somewhere in Europe on business for the Okonite Company. He sailed from New York on the S. S. *Bremen* on October 7, first heading for England where he planned to visit the Callender plant, affiliated with Okonite. Later, he hoped to get himself a little vacation and visit some of the countries he hasn't previously had an opportunity to see.

While attending an industrial advertising convention in Philadelphia recently, your Assistant Secretary saw an exhibit of W. C. Hamilton and Sons, paper manufacturers. On inquiring of the sales representative if he knew anybody named Hanson with that organization, we learned that Hugo H. Hanson, X, is now president of the concern. So we wrote him a letter which elicited this reply: "There isn't much I can say about my own history except that I came here about eight and one-half years ago as general manager and was elected to the position of president when our former President died last March. We have a very nice paper mill, making about 100,000 pounds of writing and printing papers

per day." (Secretary's Note: Any more stuff like this takes full advertising rates.) Hanson also asked us: "How is the 25th reunion coming along?" So let's switch to that subject right now.

It won't be long now until June, 1937, when you and I will be celebrating the 25th anniversary of our graduation from the Institute. How shall we celebrate it? Well, I, for one, want to celebrate it in company with every living classmate who can possibly reach a suitable reunion center, from whatever end of the earth may be his present headquarters. Our 20-year reunion in 1932 brought 47 classmates together: the largest number, I believe, we ever had since graduation. Yet that was a depression year, if there ever was one! Is there any reason why we shouldn't have twice this number at our 25th? The Class of 1911 had 53 classmates at their 25th last June. We can beat that! And we will beat it! Page Golsan, VI, who recently corresponded with most everybody in the Class in a successful effort to build a new and up-to-date list, has consented to serve with your Secretary and Assistant Secretary, as a committee to get the plans under way. This Committee can only initiate and start things; it is up to the membership to show their interest by sending us suggestions. Yes, and we'll welcome definite offers to help in organizing and running the affair. We're going to need attendance committees in various parts of the country and somebody to run some stunts and entertainments at the reunion. Are you for it? If so, write to Shep or Mac or Golsan, and give us your ideas. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

1913

You may thank one Edward Hurst for the fact that we are able to have notes in this issue. Ed and I spent a pleasant two hours together in Fall River recently. Here is one man at least, whom I know, whose daring in thought and action seems to have withstood the ravages of the 23 years since I had seen him. Having spent most of my business life in textiles I was very much interested to learn of the work which Ed is doing. He is vice-president and general manager of the United Cotton Products Company of Fall River and has developed a fabric, startlingly new in construction. He playfully describes his work as "weaving rainbows." His novel fabric comprehends an entirely unique arrangement of textile fibers and his process lends itself to an extraordinary use of color. From my knowledge of the textile industry I can comprehend the magnitude of his achievement. Whereas we in the textile industry are engaged in arranging textile fibers along age-old principles, he departs from them radically to produce a fabric of considerable versatility, both from a mechanical and decorative standpoint. I saw some of its applications in draperies, women's belts, book-binding, lamp shades, covers for

fancy boxes, and tapes for various industrial uses. One of Ed's decorative fabrics he calls "Josephine."

To use his words: "It seems that a similar fabric covered the walls of the boudoir of the first wife of Napoleon. The pattern is variegated and the surface appearance is a cross between a velour and a silk taffeta. The color scheme is a warm red with green-gold wavy threads in silhouette. The effect of the *ensemble* is glamorously rich, but proudly dignified. The green-gold tracements weave a net and capture the imagination. There is eye appeal *de luxe* in the fabric we call 'Josephine'." — By the way, I wish you would particularly note Ed's inimitable style in the description of this fabric. I am sure it proves my point that Ed has successfully resisted the inroads of conservatism. At all events, I have discovered the prize speaker, if we must have a speaker, for our 25th reunion.

From the Alumni Office I learn that John P. Coe has removed from Naugatuck, Conn., to New York City. He is still with the Naugatuck Chemical Company. — Rhys H. North, IV, has gone to Oxford, Maine, and Paul C. Warner, IV, is stationed at the Naval Air Station, San Diego, Calif. — FREDERICK D. MURDOCK, *Secretary*, 234 President Avenue, Providence, R. I.

1914

Major Bill Lucas, who has been stationed at Boston for a few years, has been ordered to Birmingham, Ala. On the evening of October 4 Charlie Wilkins, Scannell, Petts, and Leathers arranged a farewell party for him at the Copley Plaza. It is understood that Bill received an appropriate send-off.

Johnnie Leathers has been spending a number of weeks in Boston in connection with the Massachusetts State Republican Committee activities. It is probable that he may locate in Boston permanently. — In a recent issue there was reported the engagement of Bob Parsons. We are happy now to report that Bob was safely married on September 7 to Miss Marjorie Blackstone Smithwick of Cambridge. Bob and his bride are residing in Swampscott, Mass. — Frank Ahern, who is in the government park service, has written from the Grand Canyon that he and Myles Maxim recently drove together from Los Angeles through the Canyon. It is presumed, however, that Frank is safely back in Washington by this time.

These notes are necessarily short because they are being written well in advance of the usual closing date as your Secretary left on October 16 for a trip by boat to the Pacific Coast. — HAROLD B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N. Y.

1915

New Year's greetings to all the Class, with my best personal hopes that you all have a happy and cheerful Christmas and that in the coming year you will enjoy sound health and increasing success.

Here's one bright spot for this month from Carl T. Dunn, writing from the office of the Charles E. Bedaux Company of Illinois, 435 North Michigan Avenue, Chicago, Ill. This company has offices all over the world, even in Australia and South Africa. Carl says: "Twenty years out! I repeat it and wonder where the time has gone. Such a trickster is memory that the four years at M.I.T. now seem the longest. I find myself avidly reading the 1915 class notes to learn the whereabouts of my classmates, but some months it seems that most are like myself, at least in this respect: that it is hard to write a fair letter about one's own self. Employed by the Winchester Arms Company, I found myself thrown in close working relations with shop men and foremen and was well liked by them. That fact has had a determining influence upon my subsequent business life, although at the time I little realized its significance. After two years of varied shop experience I was designated to be the head of a time-study group under Mr. D. W. Merrick, who at that time was a consultant to the company. Spying on my shop friends with a stop watch! I certainly would have quit but for the restraining effect of having been married but a few weeks. My firm resolve was to remain at such a job only as long as fair play was its foundation. During a period of over a year I discovered that there was and still is a wonderful field in promoting better relations between labor and management, and that it can best be done through the medium of time engineering. During that period I had genuine scorn for efficiency experts of the red-tape and report type.

"After the War, three years were spent in the screw machine products industry in the capacity of factory engineer and assistant superintendent. The plant being small, the duties and experience were diverse. I learned much of the trials and troubles of supervision during a depression period. The year 1922 found me teaching applied mechanics and practical electricity at a trade high school. I discovered that the best way to learn a subject is to be forced to transmit it to others. With that sort of background the business improvement of 1923 found me working for a concern of production engineers that had learned the secrets of shop psychology and endeavored to accomplish a valuable engineering service accordingly. If I were to say that Bedaux engineers approached the problem of shop organization in the opposite direction from conventionally accepted industrial engineering practice, it would literally be true. During the following 13 years, working as a field engineer and later as a supervisor, I have become more firmly convinced, by many actual experiences, that the foundation in all its ramifications of good labor relations and capable supervision can be built by time engineering — not time study. This work has proved exacting of both time and effort, but due to variety of problems and personalities, it is always interesting. Most of us like to think that we have done some original

work. A practical, workable, direct application of time standards to ordinary plant maintenance is my obsession."

Our thanks to Carl for this splendid account of his business experience, which is not only interesting but illuminating in describing this highly technical time-engineering work. — We'll be having some class dinners this winter in Boston and New York, I hope, so that the next issue should contain the story of these usually amusing parties. Meantime, help! help! for class notes. — AZEL W. MACK, Secretary, 72 Charles Street, Malden, Mass.

1916

Our good friend, Ed Barry, who failed to turn up at the reunion, writes in response to a letter from your Secretary, as follows: "Starting October 15, I will be general sales manager for Riley Stoker Corporation with headquarters in Worcester, Mass. For the past nine years I have been supervisor of power for West Virginia Pulp and Paper Company and in that period have designed several power plants operating on high-pressure steam. These, I am glad to say, are all functioning well. The last design is now under construction for the new kraft mill at Charleston, S. C., which includes nine 600-pound boilers and two high-pressure bleeder turbines. Five of the company mills are now equipped with modern high-pressure power plants.

"I was mighty sorry to have been unable to attend the reunion last June and have resolved to let nothing interfere with my going to the 25th. My new address will be 4 Westwood Drive, Worcester, Mass." — I am sure that all members of the Class wish you the best of success in your new work. Possibly you may find Hartford a way station on your business trips from now on. Do not forget to stop at the Travelers' building and talk things over with your new Class Secretary.

Leonard E. Best, X, who recently moved from East Orange, N. J., to 27 Beekman Road, Summit, N. J., writes the following: "In February, 1935, I left the United States Rubber Company to be factory manager at the Richard Best Pencil Company, Inc., Irvington, N. J., and at the present time we happen to be very busy at the factory. In January, 1936 (the 23d), I married Ruth Skidmore Darwent." — The Boston Herald of June 28 contained the following notes: "Mrs. Rowland Ward of the Jamaicaaway announces the engagement of her daughter, Miss Amy Isabel Ward, to Mr. Phillips Nelson Brooks of East Kingston, N. H., son of Mr. and Mrs. Frederick K. Brooks of Haverhill. Miss Ward is a graduate of the Framingham Hospital Nursing School. Her fiancé was formerly a member of the Faculty of the M.I.T. They plan to be married next spring."

The June issue of *Credit and Financial Management* carried the following article: "Earl R. Mellen, Treasurer of the Weston Electrical Instrument Corporation, Newark, N. J., and since 1932 President of the National Electrical Credit Association, and at present a director of the National

Association of Credit Men, has been a leader in credit circles in the eastern manufacturing area for the past 17 years. Mr. Mellen was graduated from the Lowell, Mass., High School with the class of 1912, and received a degree of bachelor of science at M.I.T. in electrical engineering in 1916. He was for two years engaged in engineering work with the Western Union Telegraph Company. In 1918 he became associated with the Weston Electrical Instrument Corporation, Newark, N. J., and has served that corporation as sales engineer, credit manager, assistant treasurer, and was appointed treasurer in 1928, and elected to the board of directors of that corporation in 1935. He is also associated as a director, secretary, and treasurer with the Jewell Electrical Instrument Company of Newark.

"Early in his business career he became interested in credit association activities, and is a past president and trustee of the New Jersey Association of Credit Men at Newark. Mr. Mellen is married and is a proud parent of four boys and a girl. He is secretary of the Methodist Church he attends in Newark and has been district chairman of the Newark Community Chest since 1926. He is also a member of the budget committee of the Welfare Federation of Newark." — Earl, we hope you won't forget your 25th reunion; we missed you on the 20th.

Steve Brophy was so used up as a result of the strenuous reunion that he had to take a month off from business. He and his wife spent four weeks in Europe this summer. — Our good friend, Dina Coleman, has recently moved from the brick yards to the racing stables. In other words, his residence is no longer at Ashland, Ky., but is now 210 South Ashland Avenue, Lexington, Ky. He writes as follows: "We moved here the first of last year and liked it so much we have sold the Ashland house to the brick plant for the resident manager. While this is a horse town, it is better located for me, and we have more friends around than we did at Ashland. Since reunion I have been battling, boating, and building. The net result is a headache. Of the various small irons I keep in the fire, most of them seem to be getting chilled, due to forces over which I have no control; that accounts for the battles. On top of that we Democrats have been sold down the river, and there is no one for us to vote for.

"As for boating, I am in that in a big way. For example, there is a 45-foot Express Cruiser at Old Lyme, Conn., that I have never seen. It is for sale, and if you know of anyone who has the fever, just sic 'em on to Skipper Jones at Old Lyme, just above the New Haven bridge. This is a copper-fastened, cedar-hull, custom-built job, good for 30 miles per hour if one wants to burn the gas. No half reasonable offer will be refused. New power is indicated rather than an overhaul of the present Hall-Scotts. My other boat is larger, as befits a country-raised boy, and is on the Kentucky River, whose palisades are second only to the Hudson — in fact, a loyal Kentuckian would say

1916 Continued

they are superior. If any of the boys want to pass on this question, I would be tickled pink to run them up the Kentucky River and back, any time. The fishing, however, is punk. There is enough 22-year-old Bourbon in the boat's locker to make up for the absence of fish, also Scotch and gin. Don't crowd boys, there is plenty of room! Right now, we are trying to organize a stag cruise to Mexico in January. Tell the boys to send in applications."

Your Secretaries hope that some of our silent classmates who have not been heard from will take a tip from these interesting communications and write the Secretary, so that he may be supplied with more of the kind of news that you like to read about your classmates. — JAMES A. BURBANK, *Secretary*, The Travelers Fire Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

Clair Turner has lost none of his abilities as *raconteur* through his trip around the world in 365 days. He talks fluently of international public health policy and problems and keeps his sense of humor well under control — for brief periods. He has returned extremely well informed of international activities in health education and looks forward to further advances through the international organization of public health workers of which he is now the head. All of his stories are worth repeating and one or two might pass Review censorship, but they are being withheld until the reunion at Marblehead next June.

Dean Lobdell wrote a note *en route* to Denver from the West Coast. He reports that Neal Tourtellotte is thriving physically, mentally, and financially, with some hair shrinkage on the port bow. Neal was in New York City on a recent Monday for lunch and flew to Seattle, Wash., in time for a Tuesday dinner of the Technology Club of Puget Sound at which Lobby spoke. In Portland he saw Henry Strout who has interests in addition to the promotion of the sale of California fruit in Oregon and Idaho. One is blending coffee and we gather that he waxes eloquent on the subject of blends, aroma, bouquet, and coffee tasters' technique. Kona from Hawaii plus the more acrid touch of Guatemalan and Brazilian beans gives a cup for the connoisseur — according to one amateur coffee taster whose vocation is the fruit business. Samples and demonstrations will be ready in June.

A third exponent of the gentle art of good living, Doug McLellan, is still following the practice of architecture on the Coast. These three and no more are mentioned. With all three comes the statement that they will be present at Marblehead and later Al Moody said likewise in Denver.

Notes from others who have indicated their intention of being at the reunion are numerous if brief. One exception to the general positive report is from Paul

Gardner who writes on his letterhead as director of the William Rockhill Nelson Gallery of Art in Kansas City: "Here is my contribution to the good of the cause. Do wish that I could say right now that I would be with you in June next year, but Kansas City is a long way from Marblehead and my movements are often on the knees of the gods. But I certainly shall try hard, as it would be fun to see all the gang, perhaps more fun to see what has happened to us all! I am just starting out on a trip which should be pretty nice. The Carl Schurz Memorial Foundation has invited a group of museum people to make a survey of German and Austrian museums this fall and we are sailing for Berlin to be gone about two months. I had not hoped to get over this year, so the invitation is doubly welcome. I shall hit most of Germany and Austria, and Paris and London on the way home. My best to you and to every one, and all success to the reunion!"

Ken Lane's letterhead was a bit of a surprise: "Consulting Aeronautical Engineer, 232 Claremont Road, Ridgewood, N. J." He writes: "In response to your eloquent plea of recent date, I am enclosing my check for two dollars. If it should turn out to be no good, just send it back and I will gladly send you another one. As regards my planning to lend to the assemblage, by my presence, that element of dignity without which no such affair would be complete, I can only state that tentative would be a mild term to apply to such assurance as I can give you at this time. My best laid plans seem to suffer the same fate as those of other humans and/or rodents. My business is not so voluminous that I can afford to tell a prospective client to drop in next week and I may be interested. However, *Deo* — and the clients — *volente*, I'll be there."

Mike Brock supplemented his note with the announcement of the arrival of Donald Brock, born September 28. — This reunion serial will be continued next month for the benefit of readers whose subscriptions are paid.

W. Warren Rausch, who is president of the Arlington Housing Corporation, sends in a clipping describing the work he is doing in homes "within the price range of the average man." The newspapers noted the turn of the first shovelful of earth in the largest residential development ever undertaken in Massachusetts. It is located in Arlington Heights near the Belmont line and the construction of some 425 houses in a cost range of between \$6,000 to \$6,500 is proposed. Mass production methods, material supervision, and the coöperation of the Federal Housing Commission are expected to make it possible to sell the houses at \$50 to \$55 a month, which figures include taxes, water, betterment, and so on. It will be recollected that Rausch was appointed project manager of the Cambridge slum clearance work and he was especially pleased that the appointment was not due to political activity and influence. He was subsequently appointed district manager in charge of all the work in the area including the \$6,500,000

South Boston project. — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

1918

The ceaselessly active mind of our Gretchen is already crammed with the possibilities of a 20th reunion, now, alliteratively, some 20 months away. To this end she has the address card file up to date, so please keep the statistical part of this as small as possible by not making too many changes of address, no matter how you liked the results of the November election.

The rest of the material at hand is perversely introspective, but the reporter in us refuses to hesitate, even though it cost a dreadful sting of anguish. A clipping from the New York *Times* of Sunday, August 30, furnished through The Review Editors, reports a speech made at Schenectady by Professor Magoun, the general idea of which was that in giving "placement training" to the students, colleges must be particularly careful not to develop a smart technique by which to land a job, but rather to offer a fundamental approach by which to find the job that will offer the most opportunities both for the company and for the student. It must have been a very subtle speech, because if we remember rightly (and we do because we have just looked it up) that speech was delivered on May 16. Snappy reporting, eh what!

We also remember May 16 because that was the day we drove home from Schenectady in less than five hours. Jumping the unnecessary details, the man who delivered the speech was married on October 12 to Miss Carolyn L. Warren, lately in charge of the Lindgren Library at M.I.T. and sister of Professor Bertram E. Warren '24. — F. ALEXANDER MAGOUN, *Secretary*, Room 4-136, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1919

Important Notice. Friday night, December 4, has been chosen by our entertainment committee as the date for our class get-together. Every one be at Walker Memorial as near 6:30 P.M. as possible. A table will be reserved in part of the hall, and everybody will eat cafeteria style, each ordering what he wishes. After dinner we will go downstairs for bowling, pool, or billiards, as fancy dictates. Your Secretary has discussed this matter with enough of the members of the Class already to be confident that we are going to have a good turnout. Since this is the first class reunion since our tenth anniversary, we hope every one will make a special effort to attend. A small amount of time will also be spent on reorganization of the Class, election of officers, and other steps necessary to put the Class back on its feet.

It is planned to have occasional get-togethers each year to maintain contact between classmates, and on some of these occasions we want the wives present also. Pass the word around, because every one

1919 Continued

does not receive The Review. Send me a post card if you are coming, as the entertainment committee plans to contact all in this vicinity by phone or post card, and this will make the work easier.

The inactivity of our Class during the last few years has been a source of great regret to all of us and now is the time to show your appreciation and cooperation — all you have to do is to pass the word along and bring in a couple of classmates with you. Remember the date is Friday, December 4; the place: Walker Memorial, main dining room; the time: 6:30 P.M. We shall all look forward to seeing the old gang again. — ARKLEY S. RICHARDS, Secretary, 26 Parker Street, Newton Centre, Mass.

1921

With the deafening crescendo of the finale to another quadrennial political pandemonium thundering from all sides whilst these chronicles are assembled, we are reminded, only for its political significance, of a pleasant visit last summer with Francis J. Callanan, railroad owner, head of Callanan Brothers, Inc., and mayor of Keeseville, N. Y.; nor does the association infer that Frank is to be charged with noisy ballyhoo, for he is still the same reticent, industrious worker of our undergraduate days, unaffected by successful achievements and one on whom the hand of Time has rested lightly.

Driving through Keeseville, we finally made good on an old resolve to look up Frank. The car we had been following pulled up to the curb and, thinking to avail ourselves of an opportunity to get local information, so did we. However, we were not prepared for the surprise of seeing a very familiar, tall, young man emerge from the other car and apparently not exactly sure what impending doom our questions implied. Introductions over, we gleaned a little of Frank's doings. He was active in the lumber and supply business for a number of years until he acquired exclusive distributorship for Sun Oil Company products in several upstate counties. With mock dignity Frank told us that he was probably unique in the country's business annals as just about the only individual who personally owned a railroad! He purchased a line which once served Keeseville — but you'll never guess the reason. No, not to ship Blue Sunoco, for good-looking tank trucks perform that service. Believe it or not, the old Keeseville depot has been converted into business offices and an attractive modern service station. A choice location makes its present usage ideal, and roomy facilities provide for the requirements of the gas, oil, and fuel distributing business.

Frank has always been active in community affairs and received official recognition in being made mayor, appropriately enough on last March 17. He has so far successfully dodged Dan Cupid's darts, claiming that he has been just too busy to get down to serious consideration of a change in marital status, though how such a supereligible specimen has resisted capture is a mystery to us. An unofficial

proclamation calls upon all members of the class to visit His Honor when in the vicinity.

A memorandum from the patron saint of class secretaries, Professor C. E. Locke '96, relates that Russell C. Johnson was at the Mayo Hospital, Rochester, Minn., in the early part of the summer for a serious stomach ailment but is now back on the job, fully restored to health. Rus is with the American Smelting and Refining Company, apartado 55, Chihuahua, Mexico. — A. B. Kinzel, chief metallurgist of the Union Carbide and Carbon Research Laboratories, New York City, presented a paper on "Alloy Steels and Their Weldability" at the joint session of the American Welding Society and the American Society of Mechanical Engineers on October 22. — James W. McNaul should now be addressed as professor of machine design, University of Wisconsin, Madison, Wis.

Stuart E. Bradford is with the Lago Petroleum Corporation and has left New York to take up his new work at Maracaibo, Venezuela, where he can be reached at Apartado 172. Following are a number of recent new addresses: O. W. Clark, 472 Atlantic Street, Bridgeton, N. J.; Karl Jetter, 155 Chestnut Avenue, Jamaica Plain, Mass.; John G. Lee, Old Mountain Road, Farmington, Conn.; Edward I. Mandell, 1000 Lincoln Road, Miami Beach, Fla.; Ethan A. Beer, 7204 Moreland Avenue, Jefferson City, Mo.; Eugene A. Hardin, Chateau Frontenac, 10410 East Jefferson Avenue, Detroit, Mich.; Lemuel Pope, 1364 Bernal Avenue, Burlingame, Calif.; Thomas W. Proctor, Guntersville Dam, Alabama; Bruce F. Rogers, 319 South Barry Avenue, Mamaroneck, N. Y.

While this issue reaches you considerably in advance of the Yuletide, it is our last opportunity to extend greetings before the holidays. We do so sincerely, in the hope that the festive season may really celebrate a year of renewed activity, of marked achievement, of health and happiness. May the coming year bring even greater measures of material and intangible wealth to you all — and to your Secretaries, some class notes! Merry Christmas and Happy New Year! — RAYMOND A. ST. LAURENT, Secretary, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, Assistant Secretary, 10 University Avenue, Chatham, N. J.

1922

Your Secretary apologizes for having missed the first issue of The Review and promises to do his best to see that this does not happen again during the current school year. — Clark B. Carpenter, Professor of Fuel Engineering and Metallurgy at the Colorado School of Mines, has now been appointed head of the metallurgy department. During the past summer, he spent some time at the Institute taking advanced work leading to a doctor's degree.

It is with considerable regret that we have to report the death of several of our classmates during the past few months:

Lewers A. Boggs died at Kingsport, Tenn., on August 22. Up to the time of his death he was associated with the Tennessee Eastman Corporation. — Sterling G. Thomas died on July 26 in Newton Hospital after an illness of 10 days. For a number of years, Thomas had been with Stone and Webster. He is survived by his widow, Mrs. Dorothy Daly Thomas, and three sons, David, Gordon, and Robert. We have just received notice of the death of Felix de Martino, Jr., although it appears that it occurred on March 25, 1934. He had been living in Mexico City. Malcolm L. Fisher died on March 15 and Robert W. Olsson on April 8. To those of the Class living here in Rochester, the death of August Oddleifson on October 20 came as a great shock. August had taken a very active part in the community life of Rochester and his death has brought genuine sorrow to the colony of Technology men here in Rochester.

The Boston *Herald* recently reported that Mrs. Henry C. Allen and child had been safely evacuated from Spain to France, according to State Department announcements. Allen and his family had been living in Barcelona. Mrs. Allen was taken to Marseilles. — Lieutenant Commander Leslie C. Stevens is now assistant naval attaché at the American Embassy in London, England. — Larry Davis, who was formerly general manager of the New York division of the Socony-Vacuum Oil Company, Inc., has become vice-president in charge of sales and a director of Joseph E. Seagram and Sons, Inc., and Seagram-Distillers Corporation. We feel that this news about Larry will be received with great interest by certain members of our Class, to say the very least. — Frances Hurd Clark, one of the coed members of our Class, who also holds the degree of Sc.D. from the Institute, was married on June 27 to Robert L. Dietzold. She has been working as a metallurgist for the Western Union Telegraph Company. — The New York *Times* of July 3 carried the notice of the marriage of Wyatt Hawkins Ingram to Miss Margaret Morgan. Ingram attended the University of Chicago and Cambridge University in England, as well as the Institute, and is now on the faculty at the College of the City of New York.

Your Secretary begs to report that he will no longer be able to receive any of the visiting delegates at his quarters in the University Club of Rochester, the reason for this being that he was married on August 7 to Miss Margaret Winton of Rochester. The ensuing trip to Bermuda was made particularly interesting by the fact that no sooner had the new husband walked up the gangplank onto the deck of the S. S. *Monarch of Bermuda* than he was greeted vigorously and affectionately by one of his old girl friends of 1922, from Brookline. After such a coincidence, we feel qualified to meet any and all emergencies which our future business or social life may put before us. — C. KING CROFTON, Secretary, Rochester and Pittsburgh Coal Company, Lincoln-Alliance Bank Building, Rochester, N. Y.

1923

Apparently after a man has been out of Technology about so long, he develops a vague sense of disquiet and seems to think that it is about time that some of the boys *get together*. A note from C. P. Thayer, VII, in Miami last spring voiced the hope he'd get a chance to round up some Alumni in that neck of the woods, and a more recent word from him indicates that perhaps this fall he *will* do something about it. — In a wild burst of enthusiasm about 20 of those of '23 (of which there are some 250 in the Boston postal district) turned out to a luncheon last spring in Boston. Last week on October 19, 11 men showed up at the first Boston luncheon this fall. So strong is the feeling that *something ought to be done about it*, that there will continue to be meetings held in Boston, even if the attendance trend dips to the point where your Secretary and Howard Russell merely go over to the Boston Chamber of Commerce cafeteria for lunch together about once in three months.

However, the following showed up on the 19th and a number of others indicated that they were interested enough to try to get there at another time, so the situation is not altogether hopeless: Ed Averell, I, Horatio Bond, XV, George Bricker, VI, Charlie Burke, VI-A, Gerry Carper VI-A, Harry M. Chatto, IX-B, Harold F. Cotter, X, William A. Gallup, V, Kitty Kattwinkel, XV, and Howard F. Russell, II. A note of well-wishing was dispatched with the signatures of all present to Frank Haven, II, who was in the hospital, recovering from an operation.

Most of the other notes this month have to do with movings and removings: Walt Marder, II, has been in Boston since February as manager of the Boston branch of the American Type Founders Company, in the sales department of which company he has been since 1933. — I got a change of address for Eugene V. Ward, IV, as a result of his buying and moving into a new house at Palo Alto, Calif., where he is a lecturer in architecture at Stanford University. — J. Coleman Jones, VI, was moved from Miami to Fort Pierce, Fla., when his position changed from transmission engineer to superintendent of transmission for the Florida Power and Light Company. He reports that Jack Preston, VI, is in the rate department of this firm in Miami.

Alfred E. Perlman, XV, has moved from Chicago to Denver and is engineer maintenance of way for the Denver and Rio Grande Western Railroad Company (Royal Gorge Route — *adv.*). He explains that he has been loaned by the Burlington Railroad to the Rio Grande to assist them in their reconstruction program and voices the hope that some of the 1923 Alumni may be journeying through the Colorado Rockies, where he would be very happy to accompany them through some very delightful scenery. — Charles H. Tirrell, I, reports that he is now with the Dahl Oil Company of New London, Conn., at Waterford, Conn.,

"doing a little bit of everything connected with the oil business." He says he has a wife and two boys now. — That bit of vital statistics reminds me that I should record that Kitty Kattwinkel, whom we saw last Monday, is being congratulated on a boy arriving after two earlier children, both of them girls. — HORATIO L. BOND, *Secretary*, 195 Elm Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

1926

Thornton Owen, who has been gradually retiring his better-known name of Mooney, came to town in October on a vacation trip that originally was scheduled to include the reunion. He and Mrs. Owen spent several days with the Harry Howards in Norwood and during the visit joined the Howards in an evening's call at the headquarters of the Secretariat in Wellesley Hills. Harry is with the Plimpton Press and Mooney is carrying on the family real estate business in Washington. It was a great pleasure to meet again these old colleagues on *The Tech* and to span the decade that has elapsed since June, 1926.

New addresses reported: Robert H. Johnson, Ingersoll-Rand Company, 400 West Madison Street, Chicago, Ill.; Killian V. R. Lansingh, 7460 Beverly Boulevard, Los Angeles, Calif.; Professor Gordon F. Tracy, 2616 Van Hise Avenue, Madison, Wis.; and John M. Whitaker, Atlas Corporation, 1 Exchange Place, Jersey City, N. J. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

1927

As this is probably the last set of notes in the present volume of *The Review* that will not carry definite information concerning the development of plans for our Tenth, your Secretary earnestly suggests that you make plans now to be with the crowd in Boston in early June. Several have already given definite assurance that they will be present. For those around Boston who have not been in touch with the committee (which will no doubt be formed when this issue reaches you), please call Dike Arnold at LIBerty 3452.

The boys continue to marry and your Secretary is happy to record as follows: Miss Sylvia E. Gould, daughter of Mrs. George F. Gould of Portland, Maine, and First Lieutenant Lloyd R. MacAdam, stationed at Fort Williams (Portland), were married on June 7. — Miss Doris Irene Hawkes, daughter of Mr. and Mrs. Frederick W. Hawkes of 74 Mooreland Road, and Lyndall Raymond Perry were married in Melrose, Mass., on May 23. They are now living at 29 Highview Avenue, Old Greenwich, Conn. — Miss Edith Melvina Gearson, daughter of Mr. and Mrs. Clifton Gearson of Calais, Maine, and John Kimball Phelan were married in Calais on August 14. — Miss Georgiana Mary Galbraith, daughter of Mr. and Mrs. Robert J. Galbraith, of Camden, N. J., and Frank Massa were married on June 27 in Camden.

The New York *Herald Tribune* of July 12 reports that Fred Lutz is assistant to Mr. John J. Rorecic and therefore very much involved in seeing that their real estate production schedule of 30 houses per month in Westbury, Long Island, is met. Lutz spent several years with Goodwin Engineering Construction Company in New York before undertaking his present work.

Your Secretary has seen several classmates since early July in moving from Boston to Manville, N. J., to join the Johns-Manville organization. Two months was all that Maurice Davier and others could stand me, so I am now in Waukegan in charge of specifications at this location. I shall shortly be living at 232 North Genesee Street, Waukegan, Ill.

It is becoming more and more apparent that class notes must be written by the Secretary from newspaper clippings or his personal contacts. With this in mind, those personal observations of your Secretary will be held over until next month. — RAYMOND F. HIBBERT, *General Secretary*, Care of Johns-Manville Corporation, Waukegan, Ill. DWIGHT C. ARNOLD, *Assistant Secretary*, Arnold-Copeland Company, Inc., 222 Summer Street, Boston, Mass.

1928

The lead-off man in this month's battling order is none other than our genial friend Huyler Ellison who last reported that he was single and working for the New York Telephone Company. Huyler's line-up of jobs since he has been with the Telephone Company reads like a complete list of the organization's activities. His latest promotion established him as a supervisor charged with stimulation of toll business and the installation of teletypewriters. Huyler says Miss Beryl Hubbard is still the big moment and he says a "network of circumstances" is responsible for his still being single. From the definition of network you think of a flimsy, weak structure, so perhaps another good man is about to hit his stride down the center aisle.

By the way, Huyler Ellison mentioned that his hobby is eight-millimeter moving pictures. We're going to take time out here, because we've been riding this hobby for several years and recently got our august President, Ralph Joep, to get an outfit. Perhaps there are others in the Class who would enjoy swapping eight-millimeter films from time to time. I don't know any 16-millimeter plutocrats who can afford to pay three to six dollars a roll for film at this moment, so we will have to leave them out. Huyler, if you and other eight-millimeter fans are interested, how about dropping us a line and get this thing started? We tried to get Hal Dick to take some eight-millimeter films of his recent Zeppelin flights for our 10th reunion, but the old buzzard wouldn't even answer our letters.

Second man at the plate is Walter Hoppe who is up at Rochester, N. Y., at the General Railway Signal Company. Walter started with this company in 1928, left them during the depression, and

1928 Continued

is now back as technical assistant electrical engineer, working on train control and especially vacuum-tube applications, both to new and old signal systems. Walt announces he's married and saving his pennies again. — From Washington comes our next contributor, Abe Goldstein, who is now assistant examiner of Division 29 in the United States Patent Office. It wasn't so long ago, either, that we had a patent case and were wondering who that "Goldstein fellow was, anyway." Abe attended local law schools, attained an LL.B. and an M.P.L. in 1931 and has been admitted to practice before local courts in Washington. Yes, Sir, Abe is still single, believe it or not!

Hough is the name — Benjamin K. Hough, Jr., in fact — and when last heard from he was at the United States Engineers' office at Eastport, Maine, on the famous Quoddy project. Benny is looking for Bob Harbeck. Can anyone help him out? Finally, how about a more concrete report on your activities, Ben, and how's your family?

Howard Batchelder is now in Whiting, Ind., with Standard Oil of Indiana. He stayed at the Institute getting a master's degree until 1930, when he left Cambridge and got married. The Batchelders have one young daughter, aged three years. — Mailloux Cohen has been working with Albert A. Volk, construction company, on the Triborough Bridge in New York City, and he said he was working with Bob Cook, I. Mailloux has a boy, aged three, who, he says, can sing "Take Me Back to Tech." Atta boy!

John Collins surprised us with a reply from Naugatuck Chemical Company, division of United States Rubber Company, and he is busy selling rubber chemicals and reclaimed rubber to the rubber industry east of the Mississippi. John says he saw Al Gracia recently as he has invented a product to accelerate rubber handling and he installed such a unit in Collins' plant. The new substance has been called "Altax," named after Al Gracia. John also said he had a date for the horse races with Ray Jack. How did that jolly get-together turn out? — It must have been great! — **GEORGE I. CHATFIELD, General Secretary, 5 Alben Street, Winchester, Mass.**

1930

Alumni Day in June was enjoyed by eight members of the Class, with Bob McCarron, X-B, and Ronald Youngson, X-B, coming all of the way from Wisconsin. Both are making names for themselves out there in the paper industry. — Returning prosperity manifests itself with a number of weddings of our classmates: On June 2 Russell Stetson, II, was married to Miss Louise G. Clarke of St. John's, Newfoundland. Russ is working at present in the research laboratories of Merrimac Chemical in Everett, Mass. — June 20 marked the wedding of Miss Mildred J. Shea of Somerville, Mass., to Edward Giroux, IV, who is teaching in that city. — A week later Ken Bucklin, VI, took as his bride Miss Ruth P. Gager

of Brooklyn. — Your Class Secretary and his wife were among those present at the wedding of S. George Lawson, VI, to Miss Geraldine N. Durkee of Salem, Mass., on July 1. George is with Hygrade-Sylvania in Salem.

On August 14 Miss Muriel Bassett of Newtonville, Mass., was married to Jim Morton, XVI. Joe Wight, II, ushered at the wedding. — Miss Marie C. Mobilia of Medford, Mass., and Joe Anastasi, VI, were married on August 18. — From Akron comes announcement of the wedding of Miss Anne Gellatly of that city to our Class President, Jack Bennett, II, on October 17. The Bennetts will be at home at 816 South Genesee Street, Los Angeles, Calif., when this news reaches you. — Four other members of the Class have recently become engaged: Gordon Lister, X-B, to Miss Marion F. Olive of Larchmont, N. Y.; Jesse Billings, XIV, to Miss Norma E. Huntley of Elmira, N. Y.; Hugh Wallace, XV, to Miss Sarah Heaton of New York City; Bob Clyne, XVII, to Miss Janet G. Hughes of Glencoe, Ill. — To all of the above men who have either become benedicts or declared their intentions of so doing, the Class extends heartiest congratulations and best wishes.

Professor C. E. Locke '96 passes along to us excerpts from a letter he received a short time ago from Leo O'Neill, III, who is located in Nashville, Tenn.: "I suppose you might have speculated on what had become of me when the Blue Eagle was finally interred. Well, for a time, a skeleton organization was maintained for the purpose of studying the effects of the codes. Shortly before the Schecter decision I had been assigned to make an investigation into the operation of the multiple basing point system in the lime industry. The investigation was continued after the NRA died a natural death and, in fact, was completed only about the first of the year, at which time I was given notice of termination because there was no further work to be done. . . .

"I was fortunate in being able to secure a job with the Department of Labor as a regional supervisor of a building-permits survey, the survey in operation in about 75 of the largest cities of the South, with more than 100 WPA workers collecting building statistics. While I am not learning much about the construction industry, except from a statistical analysis of the volume of construction, the administrative experience is well worth all the grief involved."

We pause for a moment of tribute to the memory of S. Leon Karel, II, who met death in an automobile accident on September 27. To the members of his family the deep sympathy of the Class is extended.

Hal Baker, IX-B, has resigned his post on the faculty of the high school at Biddeford, Maine, to accept a fellowship at the Harvard Graduate School of Education, where he will oversee the work of apprentice teachers who are doing graduate work. — Dick Barnes, X, is now a member of the technical service group of International Nickel and is

specializing in the application of nickel products in corrosion resisting service. — The following bit of news comes from the pen of Fred Twarogowski, II: "The two weeks of active duty for Coast Artillery Reserve Officers at Fort Adams, R. I., this summer almost took on the aspect of a 1930 reunion. A great time was had by all, including Al Carideo, II, Charlie Smith, II, Norm Smith, II, Hal Spaans, XV, and myself. Spaans came up from Pennsylvania, where he is still operating the Bell System. Norm claims to be an important factor with Crosby Steam Gauge, where he is teamed up with Jack Jarosh, II, and Jack Senter, II. Charlie is tangled up in one of those myriad alphabetical agencies that furnish jobs to deserving Democrats. I'm still struggling over a drawing board at Bethlehem Ship in Quincy."

An answer to the Secretary's prayers was this interesting letter recently received from Sanford Moss, X: "Details concerning myself can be disposed of in a very few words. I returned to the University of Cambridge in the fall of 1934 and took a Ph.D. degree in the laboratory of colloid science under Professor Rideal in November, 1935. I then returned to my old position in the research department of the Viscose Company and am carrying on business at the same old stand. My quarters at present are at the University Club in Wilmington, Del., and I should be glad to have anyone down this way look me up. Byron MacKusick, X, was married to Ruth Barrett last summer which leaves me as the only single D.U. in the Class. He is working for Pure Oil in Chicago. The last I heard from Carl Franz, X, was on the birth of his daughter some little while ago. At Easter I became the godfather of Helen Carolyn Preble, younger daughter of Joe Preble, XV. Joe is still with Congoleum-Nairn, but is now located at Westminster, Md. On December 5, 1935, Doris and Greg Smith, X, announced the arrival of David King Smith. The last word from Greg was an admission that he owed me a letter and I had to send a friend from England up . . . to get that. . . ."

Many thanks, Sanny and Fred, for your contributions. Let's hope all of the other boys will take the cue and do their bit in a literary way so that we may be represented each month in *The Review*. — **PARKER H. STARRATT, General Secretary, 75 Fenno Street, Wollaston, Mass.**

1933

You fellows apparently have not shaken off the effects of the summer yet at this writing, if the volume of my mail is any indication. No time for writing letters? Maybe business is so good you are working overtime, or are you all getting to be henpecked husbands and don't get around to have anything to write? At any rate let's hear from some of you so that we can keep this column full of current information. We are all interested in what you are doing and how you are.

Here are a few announcements from the newspapers: First, the marriage of Miss Marjorie Hoy to Melvin E. Dolan,

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September 1; the marriage of Miss Patience Brewster to David Roy Cutler on September 12; the marriage of Miss Rebecca Norcross to Thomas M. Chadwick on November 28; then, the engagement of Miss Viola Snow to Alfred G. Payne.

Well, that's the story for this time. As this is the last issue before the Christmas season, may I extend the season's greeting to you all. — GEORGE O. HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N. Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-107, M.I.T., Cambridge, Mass.

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C. J. Wilson is the next one to break into print: "Just a word from a chemical engineer on the 'sunkissed' shores of California. Bill Barker and I 'Forded' out to this neck of the woods last summer, after listening to the funeral services of Old Man Depression at Symphony Hall, feeling like a couple of flaming torches about to set the world on fire (and where would be a better place to light than the California oil fields?). But alack and alas, we have but the dying embers of our torches to remind us of our Union Oil Company pick-swinging days. Speaking of 'a lass,' I was married to an imported Bostonian, Miss Dorothy McGeough, on April 17. (I still haven't seen any of those California beauties the chambers of commerces' press agents like to rave about.) I am at present located with Shell Oil Company as an analytical chemist here in Martinez. It seems good to knock the dust off 'Treadwell-Hall' again. As for Bill, the last I heard from him he was fleeing the country for his old hunting grounds about Hingham."

Ben Berger has found work in Boston recently. His experiences have been as follows: "My own experiences in searching for a job are similar to those of most of the other fellows. I had my pet theories as to the type of position for which my training and inclinations fitted me, but after several months of loafing I threw these theories in the ash can and landed a job in New York City. After several months working there, I was notified by the Placement Bureau of an opening with the Boston Housing Association. I had an interview with the director, received the position, and have been working for the Association since. My work consists mainly in studies of housing conditions in metropolitan Boston. I also do inspection work in cooperation with the city's health and building departments. After nearly a year of inspecting dwelling units in this city, especially in the north end, I feel qualified, if not exactly proud, to call myself a two-holer expert. While working in New York I saw Maurice Avery quite often and enjoyed many beers in his apartment in Brooklyn. George Reece is in Boston at the present time and is attending the Harvard seminar on air examination. . . ."

Don Gutleben wrote on the San Francisco Overland Limited while on his way home for a two-month vacation. Here is

his story: "Here I am speeding along the rails across the state of Nebraska bound for Chicago and points east. The train is air conditioned and it's comfortable inside, but outside it's like a furnace with the thermometer hovering around 115 degrees, more or less. I suppose you wonder how I happen to be on a train nearing Omaha instead of helping Uncle Sam run his canal in Panama. Well, I decided to take my two-month vacation (with pay), so I hopped aboard the Panama-Pacific liner *Pennsylvania* on July 17, arrived in San Diego for a day at the fair on July 24. Then I headed north for a week with my aunt in Hollywood, where I did *not* see a movie. The next jump was to good old San Francisco (the old home town). Naturally I was very busy visiting friends, relatives, and so on. I also landed a job, if I don't go back to Panama, with the Spreckles Sugar Company. They are going to build a new beet sugar mill in California and the experience on a construction job of this type would be valuable. I also visited several other plants around the Bay region, as well as the two huge bridges. I was lucky enough to get a pass to go up to the top of the 750-foot tower on the Golden Gate Bridge; it was some thrill and I had a great view of the surrounding country. The resident engineer for the American Bridge Company is Mr. Kean '20, so we had a little chat. Right away he asked me if I knew 'slave-driver' Smith!

"I wanted to come East on one of the new streamliners, but they were all sold out until nearly Christmas. It shows what the cash customers want. So I grabbed the next fastest on Monday night from San Francisco. I have just about decided to resign the job in Panama as I have two pretty good openings in the States — one in the East (Ohio) and one in the West. I'm afraid if I went back for another year that I'd have a tough time breaking away and so it would mean the rest of my life in the tropics and I don't like the idea. I had a wonderful time there and would not have missed the experience for anything. The rest of the gang from Tech are staying on. Jack Carey '34 is starting his third year in the locks division as is Earl Murphy '34. Ken Ryder '34 is with the transportation division; Mal Stevens '34, with the municipal engineering, and Connie Chase '34, with the electrical division. Jun Eder, the only one of the '34 bunch who left, is now working for American Radiator. Of the bunch who went down in July, 1935, Dick Brown, II, is with the commissary division in the cold-storage plant; George Dunlap is in the electrical division; Nels Thorp, with the storehouse division; and Ernest Dockstadter is at the oil-handling plant. On July 11 George was married to Miss Grace Golden of Arlington, Mass. The couple flew to the northeast part of Panama for a honeymoon."

We have the following wedding and engagement announcements: Armand Philip Bartos and Miss Martha Voice have announced their engagement; Everett Beede and Miss Catherine Jones are to be married; Fritz Reber and Miss Martha Albrece

will be married by the time this issue is distributed; the engagement of Lieutenant Stanley Alexander and Miss Lois Nivling has been announced. Art Hamilton and Miss Evelyn Smith were married on September 9. Congratulations to all you boys and gals.

I also have a memorandum from Professor Locke '96 as follows: "Carl F. Floe has resigned as assistant professor of metallurgy at Washington State College to accept a similar position at the University of Notre Dame, South Bend, Ind. He had the misfortune when he and Mrs. Floe were traveling by automobile to his new job to meet with an automobile accident. They were on one of the through roads in New York State when another automobile came out from a side road without obeying the stop sign. Fortunately neither sustained any serious physical damage, but the car was incapacitated, so that they had to continue their trip by train. One satisfactory feature was that the person who hit them was not only fully liable but also carried satisfactory insurance, so that Floe was able to collect satisfactory damage." — Professor Locke also sent along the following memorandum: "Ed Clark is working for the Climax Molybdenum Company in the high altitudes of Colorado near Leadville. He started in on the surveying crew as an outside rodman, but after two weeks he was put to work splitting diamond drill cores, surveying diamond drill holes, and making blue prints. Incidentally his blue print technique was not so hot, and it took him some time to learn how to produce a good print. His next work was in charge of expediting the completion of the ditch for water supply. Then he was promoted to the position of surveyor's helper in the mine, which he was still holding when he wrote at the end of September. The mine is a large one and is expanding to a daily tonnage of 10,000 tons. The company is constructing a new change house, hospital, recreation hall, and additions to the boarding house. However, conditions are rather tough and there is a constant turnover of employees."

Jack McKeon is down at the United States Naval Air Station in Pensacola, Fla. To quote his own words: "There is nothing of interest or excitement about a routine training schedule; I get more kick out of a roller coaster." I guess most of us have our own ideas about how much excitement there is to an air training course. — Bill Stevenson went up to the Boston and Bangor stations of the Practice School a year ago. The first of this year he began looking for a job. One thing after another fizzled out until suddenly he landed a job with DuPont, thanks to the Placement Bureau. He is working in their paint and varnish factory in Everett. Since the first of June he has been on the paint control bench in the laboratory. He has to check every batch for color, hiding power, viscosity, gallon weight, and so on, before it leaves the factory. They have been running full speed all summer, trying to keep ahead of the back-order list. He says that it is gradually growing shorter,

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and that they are now beginning to accumulate some stock in the warehouse. Bill must be having quite an interesting time with DuPont.

Gene Nohl perhaps has been having the most unusual experience of anyone in the Class. Last February he was asked by a Hollywood organization who have contracts with Gaumont British and the Argon-aut Corporation to take charge of the diving end of the underwater photography operations which were scheduled to start this last summer on the *S. S. Lusitania*, which lies in 310 feet of water off the Irish coast, with an option on salvage work. He says that there have been so many delays in getting organized that they have had to postpone operations until next spring. Since this is an unprecedented depth, he has been working on some new principles in connection with the design of a diving suit which he hopes to have ready for this work next spring. The new suit makes use of artificial air made up of helium and oxygen and is completely self-contained. During the past summer he made a short try for the *Westmoreland* in northern Lake Michigan. A friend of his organized the expedition. They were successful in locating the ship but she was badly broken up and her cargo of whisky was completely destroyed. Gene says: "This business of chasing the end of the rainbow isn't all that it's cracked up to be."

I have quite an interesting epistle from Lars Anderson: "It's great stuff to know that '35 is still alive and carrying on in true 'senior banquet' style. I don't know about the rest of the gang, but, for my part, luck has broken for me everywhere. After graduation I returned to school along with Paul Daley and finished up in half a year the havoc caused by Physical Chemistry. We had just a grand time playing hockey and carrying but 35 hours a week. I never knew that Tech could be anything else but hell until that half year. After about three or four weeks' vacation Paul and I both landed jobs in the same week, he with Barber Greene and I with Gillette Razor Company. My position has been just one big holiday ever since I started and my enthusiasm is just as high now as when I started. The work is divided between production and cost accounting. I happened to be one of the screwy individuals at Tech who liked accounting, particularly cost, so that the latter part of the job suited me fine. In fact Daley and I did a cost accounting thesis on depreciation — enuf said! My boss is one grand scout, a Dartmouth man, Class of 1925. We both go to lunch together along with the factory manager — a sort of unusual set up, but there is a very friendly atmosphere in the entire plant. We are bothered by one other man in the cost department, a fellow from the 'finishing school up the river,' but he's sort of harmless. Quite a combination, Harvard, Dartmouth, Tech! All the rest of the details are just as good: a five-day week, bankers hours, nine to five, and 25 bucks a week, what else? I'm bragging now. I have been following the boys in The Review with great interest and think

that when it comes to writing you've got our column over the rest like a tent. (Secretary's note: I wish more of you fellows thought the same thing and perhaps then I'd get a few more letters out of you. Many of you have been quite faithful in keeping me informed, but the majority seem to be rather reticent about giving me the low down.)

"I would appreciate another dope sheet from Duff — what Duff — or Marmalade P. Vestibule, Bustley H. Bloomers, or Art King. By the way I've got a cute blonde chasing me who lives in Art's fish town of Gloucester, a Miss Joan Ehler, by name. She says she knows Art well and thinks he's an awful snob. Daley writes to me quite regularly from his location in Aurora, Ill. It seems that he worked with Barber Greene for four months and then took another job with a similar company by the name of Stephens-Adamson Company. Here he is doing drafting work. I bumped into Elmer Roth the other day during lunch hour down town. He, if you remember right, had the prize job with Procter and Gamble. However, now it seems that he doesn't like the traveling connected with it and so was looking for another one while home on his vacation. Speaking of vacations, I am still griped because I started out on mine two weeks ago and was called back to work after two days on account of rush business. As usual I'm waiting for the first frost, so that I can get on the ice again and play some amateur hockey this winter. I haven't changed a bit when it concerns the 'ol' pastime'."

Our next letter is from Charley Smith. Some of the information has appeared in The Review before but I think it is of sufficient interest to include his whole letter: "What I have to say will probably be pretty much disjointed, with news that I have picked up here, there, and everywhere about the Class. I'll just put things down as they pop into my head and you can pick what is new out of the jottings. Dick Smith and Johnny Demo are the two I can probably give the latest dope on. Dick is still in Boston with the Factory Mutual Fire Insurance Company. Dick says he's still looking for a one and only. He claims to have tried out numerous fair ones, but without falling for any. Johnny Demo is with Tidewater Oil Company in Bayonne, N. J. Johnny is working in the development department and likes his job very well. Incidentally, Dick Smith is rooming in Brookline with Dave Dale. Dave is keeping the wheels of industry in motion at the Gamewell Company in Newton.

"Dick Campbell, now an instructor in the electrical engineering department at the University of Kansas, was around the Institute one day in August while I was there. Dick was on his way to Portland. He was very much interested to know where his pal, H. William Parker, both of 'double degree' fame, was. Just in case you don't recall the 'double degree' reference you certainly must remember President Compton promising two strong right-handers at the University Club one night in May, 1935, an extra degree for

their marksmanship. From other sources I have since heard that Bill was working up in New Hampshire somewhere. I saw Charlie Ross at the school during the Spectroscopy Conference in August. Charlie, being an employee of a color company (up in Glens Falls, N. Y., I think), was taking in the confab. Bill Abramowitz was around the Institute for a week in September, working on a little special research for his company. Out here in Buffalo, Reid Ewing, working for Linde Company, lives about two blocks from me. Lou Garono was here in Buffalo during his vacation from DuPont's development department at Wilmington. However, I didn't get out here till about two weeks after Labor Day, so I didn't see the little strong man.

"I was told that Stocky visited Boston this summer while on his vacation, but you undoubtedly have some better firsthand information on Wimpy, so I'll say no more about that. One day I ran into Steve Remy in Cambridge. Steve is still with the Boston Woven Hose and Rubber Company. Art Crowley is with the ammonia division of DuPont down in Belle, W. Va. Mike Kelakos is rumored to be working with Mathieson Alkali Company, near Buffalo. Warren Sundstrom is with Humble Oil and Refining Company, way down in Texas. Thonet Dauphiné is now Mr. Dauphiné to undergraduate chemical engineers at Tech. Hank Ogorzaly and Roy Whitney are assistant directors in the Chemical Engineering Practice School, at Boston and Bangor, respectively. Johnny Howell is with Union Carbide, also in West Virginia. Warren Clapp is an assistant in the Electrical Engineering Department at Tech. Gay Rich is with Hygrade-Sylvania Company in Salem, Mass."

Charley also sent me a shorter note a few days later which gives the following additional information: "Here's another item that I forgot to put in the last letter. Dick Smith walked into the Dutchland Farms ice-cream stand on Memorial Drive, Cambridge, one night last summer, and who should be behind the counter serving them up, but Freddy O'Brien. It seems that it wasn't a case of Freddy's being among the few in the Class who were hard put to find work — just a case of convenient employment for a Cambridge 'man about town' (by his own admission) on his vacation from medical school. Here are a couple more last minute lines: Izzy Woll was still in the employ of the Fore River Shipbuilding Works when last seen in August; according to Warren Clapp, Johnny Brosnahan was at the same time still with Bethlehem Steel Company at Bethlehem, Pa." Charley has a job in Buffalo, but despite my urgent requests, he refuses to mention what it is.

Ed Clark crashed through again with some information about Course III: "Mal Porter has left the Cripple Creek Milling Company at Cripple Creek and is now employed by the Dorr Company at Philipsburg, Mont., in the capacity of junior engineer. As far as I can tell from his letters, he spends most of his time with the boss's daughter in the beautiful

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Montana sun or in Butte trying to see the mayor for some funny reason — some job! Brosnahan and Madden are with the Bethlehem Steel as far as I know. Seaver spent last winter and spring skiing and working for the General Electric Company, mostly the former, I expect. I saw him on Mount Washington last spring. Sanderson and Lane are still with the American Smelting and Refining as far as I know. Casale is with the Utah Copper Company in Garfield, Utah. . . . Lovering holds down a ditch-digging job with the Phillips Petroleum in Oklahoma, while Arakelian is supposed to be out there somewhere too. Jim Eng has a job with the Halcomb Steel Company in Syracuse. Bob Clarke, who returned to Technology as a part-time assistant last fall, has taken a position with the Norton Abrasives Company in Worcester. Jorge Villa is the only father in our bunch. His charming offspring is a boy, born on April 4. The little blessing from heaven weighed eight pounds. Jorge was married soon after graduation; I am sorry, but I cannot remember his wife's name.

"As for myself — after struggling through two months, April and May, which were nightmares to say the least, I walked proudly up the stairs of Symphony Hall on June 9, to be designated a master. I was half asleep during the exercises, because I had met Pete Grant at the alumni banquet the night before and we had talked over old times. On June 19 I left my dear, dear home and headed West with a new car and bright thoughts in my head for all. After driving to Denver, up to Butte, across to Wallace, Idaho, and down through Salt Lake City to Climax, I landed myself a job in the engineering department of the Climax Molybdenum Company. The altitude here is 11,500 feet. If anybody tells you the sun is hot in the tropics, send him up to Climax. I worked outside as a rodman for a while. The first day I ran around without a hat, and my scalp was actually burned through my hair — no crew hair cut either. . . . However, you don't get sunstroke up here, which is some help. Now I am working underground, and the mine is exceedingly cold. You cannot imagine how much a man appreciates flannel underwear until you have worked underground at Climax."

Otto Zwanzig and Herb Matchett have been having quite a lively tussle whenever they meet. Herb is working for a consulting engineer on the management of private power plants. Otto, on the other hand, is working for a public utility attempting to increase power sales and encouraging a shutting down of uneconomical private plants whenever possible. We hope they don't come to blows over it.

Dick Lawrence forwarded a letter to me which was written by Paul Gerard: "While in Detroit I saw Lew Simon and Ed Geittmann '34 many a time and we tried to bring back the old days at the Institute. Lew Simon when last seen had just purchased a flivver which in my capacity as Ford expert, 'hm hm,' I pronounced as unfit a vehicle as I ever

saw, but Lew, with a Chevrolet stubbornness, managed — I should say contrived — to make that old 1931 Ford respond slightly better than a Mack truck. Transportation is everything these days, especially when one has an apartment and the street cars stop running after midnight, eh what? As for Geittmann, after many years of faithful service he canned his model A for a big Buick — one has to keep up you know — and working for Chevrolet, to drive a Ford is not the proper thing. Suppose I had anything but a Ford, it would be high treason."

(Secretary's note: To clarify the next paragraph of this letter I would like to mention that Paul has been working for Ford Motor Company in their Rouge plant in Detroit and has been transferred to sales in Texas.) "After all these months in the factory at the Rouge, I certainly appreciate wearing a clean shirt and working in an air-conditioned office (installed by Carrier). I have gone from one office job to another, and at the present moment, due to the absence of the regular man, I have been put in charge of all the Houston and Oklahoma City branch auto shipments. This is one swell job, plenty of work but never a dull moment.

"The office hours are 8 A.M. to 4:30 P.M. but you will find me on the job at 7:30 A.M. and still there at 8 P.M., lining up the cars for the next day's production. There is a bunch of darn good fellows at this branch and I have made many good friends. We turn out about 200 cars a day, and a cleaner plant you never saw. That may be the influence of the nearby Centennial and the resultant afflux of visitors to the plant. In order to enable these visitors to see the workings of the final line, we start the final line at 10 A.M. and shut down at 6:30 P.M. instead of the usual hours. In another week or two I expect to be given a road job as company representative in pushing the sales of our cars in the never ending fight for leadership with Chevy. In a month and a half I will leave for good old Mexico to work in the Mexico City plant, after having been in almost every phase of car manufacturing and distribution. If you are planning the purchase of a new automobile, may I give you a tip: wait until you see the '37 Fords roll off the line. They will be the goods, what I mean! I understand that Winnie Winiarski is in Denison. I will write him, care of his job, to come down and see the fireworks at the Centennial."

Our last bit of news is from Dick Lawrence. He has been having quite a time handling a repiping job in the plant as well as his usual work. He has been putting in a lot of overtime but seems to like it. He also mentioned that Dave McIntosh, foreman at the Mack Molding Company, is now a proud father. The son, Davis Charles McIntosh, was born on June 27. In the last issue I mentioned that Dick Bailey was down here for a visit and stopped in to see me. My memory has now returned sufficiently to mention that he is working for Tennessee Eastman Corporation in Kingston, Tenn. Walt

Byrne was here to see me a while ago on his way back East. Walt's job folded up with the rest of Quoddy a short time ago and he was down in this part of the country to see about a job in Mississippi and possibly one here in Tennessee. I am still not sure whether his prime motive in seeing me was because of myself or because of my position. Walt and his wife were enjoying their trip about the country.

A short time ago I received a letter from the Advisory Council on Athletics. As in the past, they are in the process of raising a fund to assist the various sports at school. I think it would be a fine thing for the members of our Class to assist in raising this fund. Many of you should be in a position to help by this time and anything you can contribute will be appreciated. Please make your checks payable to Ralph T. Jope, Secretary-Treasurer, and mail them to Mr. Jope '28 at Room 11-203, M.I.T., Cambridge. — ROBERT J. GRANBERG, *General Secretary*, Y.M.C.A., Knoxville, Tenn. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

By far the most important news of the month is the marriage of our Class President. On Saturday afternoon, November 7, Miss Carol Spedick, daughter of Mr. and Mrs. C. E. Spedick of Garden City and Bayville, Long Island, became the bride of John C. Austin. The wedding was performed before a small gathering of intimate friends at the Little Church Around the Corner in New York City. After a brief honeymoon, Johnny returned to his work at the First Boston Corporation, where he is now employed in the bond department, having been graduated from the position of "runner." During the month of October, Jack and Henry Cargen were living together at 36 Sidney Place, Brooklyn, N. Y. Henry was in Boston one week-end in the middle of the month, but had little news to offer.

Under the leadership of Bob Sherman, a group of members of our Class gathered in the faculty dining room of Walker on Saturday evening, October 24, to eat together and exchange anecdotes. Coming all the way from Hartford, we had Dorian Shainin of Hamilton Standard Propeller. A summary of his existence since last June includes calculating design, size, angles, pitch, and range of controllable and constant-speed propellers, writing to foreign licensees of the company, learning things that were never told to him at the Institute (aerodynamically speaking), buying a car, winning a radio by writing 25 words for R.C.A., and living with Sam Loring in a boarding house at 36 Judson Avenue, East Hartford. Dorian says his company are grand people to work for, and no work on Saturdays makes things rather pleasant. Sam Loring is doing stress analysis for Chance-Vought and spends all his evenings with Timoshenko's book.

On Dorian's left sat Bill Nichols, 41 Edison Street, Quincy, who is working in the technical and design department of

the Bethlehem Shipbuilding Corporation. He tests installations of pumps, boilers, compressors, and so on, aboard ship. He especially enjoys the trial trips aboard the warships. — Walt Squires, having just returned from the Chemical Engineering Practice Schools at Buffalo and Bangor, was able to attend the dinner. He is now working at the Boston station and lives in the Graduate House as do Herb Borden and Charlie Holman, who are in the same group. Walt says that Charlie (who will be remembered as the noisiest member of our Class) met the girl of his dreams while at Buffalo; no engagement announced as yet. Herb is still single, but we wonder for how long. Squires finds safety in numbers, the same as ever.

Fellows in five-year courses who attended the dinner were Ed Halfmann and Bill Saylor, VI-A, and Dave Gildea, XVI. Dave expects most of the year's work to consist of a whopper of a thesis. Since at that time he had not yet started the thesis, he was spending most of his time wondering what to do with his leisure. — Bob Hannam, a power sales engineer for the Edison Electric Illuminating Company of Boston, also honored us with his presence. Bob is living at home, 23 Lincoln Street, Lexington, and about all he had to say was that marriage was not an immediate prospect (whatever that means). — Elliott Robinson was on hand to say that he is spending his time washing kitchen walls and polishing furniture and seeking employment of some other kind outside the home.

Finally, we had on hand Brenton Webber Lowe to tell us how things are progressing at the Scovill Manufacturing Company of Waterbury, Conn. Brent is taking an advanced training course, which seems to consist of working on the various machines around the plant, and enjoying life. The company manufactures such things as blanks for coining Chinese money, buttons, screws, bolts, Lady Astor lipstick holders, and cocktail shakers. Brent had a letter from Claxton Monro, from which we gathered that Clax is working as an observation engineer for the Guaranty Trust Company in New York City. He is working in various departments, observing the operation of the business. The company seems to look after their help very well, so that Clax is taken care of. Among other things, none of the help is permitted to marry until he is earning at least \$30 a week. — Other news brought out during the evening's conversation was that Aaron Loomis is working for the Simplex Wire and Cable Company here in Cambridge, and that Dave Werblin is an architect for a lumber company and has already designed many houses. Dave is the only architect of the firm.

Course I. The first letter from any member of Course I came from Bernie Gordon, who writes in part: "I'm still located in Nashua, N. H., and I expect to be here for a few weeks more. (This letter was written about the middle of October.) Our surveys are fast being completed, so I can't be sure where I'll be after that

time. Burnsie is still with us, but he is now working in Ayer. Since he is in a field party, he is more apt to move than I am. We are employed by the Corps of Engineers, United States Army. The work is concerned mainly with the preliminary topographic surveys of possible reservoir sites for flood-control purposes. When completed, these surveys will form the subject matter for a report to be delivered to Congress in January. Following the report, Congress is expected to allot money for the sites which are the most worthy. My work in the office consists of computing, drafting, checking, plotting, and any other job which might turn up; I even sweep the floor occasionally. At the present time I'm doing all the office work for about ten parties, only a few of which are doing the same thing. They are scattered for a distance of 70 miles and may be in Ayer, Clinton, Fitchburg, Mass., Nashua, N. H., or several other cities. I am a sort of contact man between office and field — keeping check on progress, quality of work, difficulties in the field, and dozens of other things. I'm getting good experience, lots of responsibility, and also quite fat from eating too well."

A letter from Halsey Weaver bears the good news that he is now employed, having worked steadily since September 1. The job is the same that Ariel Thomas had this summer in Worcester. The letter continues: "During the summer I was more or less working for my dad, helping prepare estimates for road work. For a few weeks I was time keeping for my brother on a road job up in New Hampshire. . . . The work (he has now) is mostly outside work, surveying of all kinds except precision. We do some supervision on construction work, but mostly survey house lots and farms. The boss is consultant on home development projects for real estate firms."

Stan Levitt also writes to say that he has a job: "I looked around New York for an engineering position for several months, but with no luck. I finally took a job selling in one of New York's bigger department stores. While I was there, I was completely surrounded by college men in similar circumstances. Finally, one of the million applications I made out took, and I received an appointment as a United States transit man in the general land office, Department of the Interior. It is swell work and a real man's job I'm doing. The pay is remarkably good. All expenses are on Uncle Sam and I'm given a swell opportunity to see the country. We have just come down from northern Wisconsin and we are now camped just 15 miles from the famous Hot Springs, Ark."

From Al Del Favero comes the following: "Started the summer with Sibby Mazzotta on the Middletown, Conn., highway bridge project working for Merrit, Chapman, and Scott. When the work was slowed up because of delays on the caissons, we were laid off. Since then I have been working with the newly organized A. L. Del Favero and Sons Company. We are going in for small home construction in a big way. Have bought a

plot of 20-odd acres for development and have just started the first two houses. I expect to stick until I get a permanent position more in the engineering line. The catch is that I work regularly and haven't time to look for the job I want."

Frank Berman was at Technology the 23d of October, and I met him bent over a calculating machine. It seems he was pretty surprised when I informed him that he was working for the United States Army. He did have two weeks of active duty during the summer, but there his Army work ended. Frank is working four days a week as a geodetic computer. He was around school because he is doing a little work in his spare time for Professor Spofford '93 by helping to check the galley proofs for a new book which our structures professor is publishing on indeterminate structures.

Course II. Two sons of Course II have responded for this month through the secretary, Jim Patterson. The first is Phil Ober, who writes: "The only reason that I have not written before is that there has not been anything to say. Yesterday, however, I accepted a position with Graton and Knight. Yes, the same place that Laddy is working; in fact, Laddy practically got the job for me. He called me up about a week ago and told that there was an opening in the company and suggested that I take a crack at it. So I went and had a long talk with Laddy's boss, and the result is that, while he had found a better man to fill the job that Laddy had in mind, he offered me a job in the maintenance department. So Tuesday morning (October 13) at eight o'clock, I turned into a working man. I expect to have a pretty good time; the work sounds interesting and not too hard, and then things are never very dull when Laddy is in the vicinity. In the line of more general news: Ham Migel accepted a job with York Ice and I guess that he is working there now although I have not heard from him. Hansford is back in school, taking two courses and finishing up his thesis so he can graduate in February. Tom Nelligan, I guess I still think of him as Course II although he did transfer into IX-B, is taking things easy up in Harvard Business School. He thinks maybe sometime he'll be a business man."

Art Sarvis had some very good news to tell, part of which is turned over just as he wrote it: "As for yours truly, I arrived in West Allis [Wis.] the 29th of June, went to work the next day, and have been bumping along in the typical Sarvis fashion ever since. I spent the first seven weeks on the centrifugal pump test floor and the last nine in the foundry. Have worked as a molder's helper, on the cupolas, the loam shop, and the core department. So I've managed to get a pretty good idea of foundry production. Next week I start working in another department; I don't know whether it will be in the office or in the shops. I would prefer the office for the winter months because it's damn cold around here in the winter. The two most interesting features about this job are that living expenses are

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ridiculously low and there is plenty of variety from an engineering standpoint. — Chet Meyer arrived here about the middle of August and went to work in the hydraulic drafting room for about five weeks and is now in one of the shops doing layout work of some kind. I don't see very much of him since we work in different departments."

Some comments from Jim are: "As you have probably gathered from the above section of Art's letter, he and Chet are employed by the Allis-Chalmers Company way out in Wisconsin. Art also said that he had received a letter from Cesar Calderon, who is doing work on the design of evaporators in his native land, Puerto Rico. Next spring he expects to move to this country to work in Beloit, Wis."

Courses III and XII. A letter from Charlie Price, Hotel Wallace, Lebanon, Pa., covers the news from Courses III and XII. He says: "Kuryla is back at the Institute after working in several different mines in Mexico during the summer, and being an assistant foreman in one of them. — J. P. Hayes is a surveyor in the Fairmont coal mine of Bethlehem Steel. He reported there in July after the short training course at Bethlehem. — F. M. Boulware and A. P. Hornor, Jr., are working as muckers in the United States Mine at Bingham, Utah, where they live in the United States Hotel. The mine recovers lead, zinc, silver, and gold, and is located just above the Utah Copper Company's pit in Bingham Canyon. Boulware writes that the 'hunting' is excellent. I am now working as a second-class miner in the Number 3 mine of the Bethlehem Steel Company at Cornwall, Pa., and living in Lebanon, where our concentrating plant is located."

Course V. The following news about Course V is written by Bob Sherman: Late October finds all of our Course busy. Willie Anslow, the sole "forgotten man" now that Henry Herpers is employed, is making arrangements to assist a doctor at Tufts Medical School, teach chemistry there, and eventually to receive an M.D. It looks as though our Class might some day boast a prominent physician. Most of the bunch are back in school in one capacity or another, in one place or another. At the Institute as teaching fellows are Joe Ackerman, Fred Carren, Bud Milone, Barney Vonnegut, and yours truly; Mitch Sieminski as a research assistant in mechanical engineering; Charlie Saffer, as a graduate student; and Ben Dayton, working on his thesis and thinking about an advanced degree. Art Sedoff has obtained a research fellowship in the School of Forestry at the University of Idaho. Alice (Hunter) Kimball is doing apprentice teaching in New York.

The other fellows, the working men, include Don Thompson, Bob Van Patten-Steiger, Louis Stahl, and Harry Donaldson, who are plugging away at the same old jobs, and a recent addition, Henry Herpers, who is stationed in the research lab of analytical chemistry at the Calco Chemical Company in Bound Brook, N. J. Henry is doing mild forms of research

and likes it pretty well. — Louis Stahl drops in now and then to say "howdy," but has furnished little information. His periods on the road for his father are becoming more frequent, though he says that being chief chemist keeps him in the lab plenty. — Don Thompson has written quite a bit. It seems that he and Ed Nolan call on Carol Klein occasionally, and are actually "on the go" most of the time; he adds that he has found no difficulty in making social acquaintances in Passaic. With regard to his job he writes: "My work is no longer research. For no other reason than that they needed another man to work on latex development, I was transferred about a month and a half ago. My work is routine but requires outside study and has good possibilities for advancement, so I shall do my best." Atta boy, Don.

As for us research fellows, Bud and I are minoring in biology, Freddie in metallurgy, and Joe and Barney in math and physics. All of us, with the exception of Barney, who plans to major in physical chemistry, are majoring in organic chemistry. Aside from that we spend the remainder of the time assisting in various labs which is interesting and excellent training: Freddie as lecture assistant to Professors Huntress '20 and Ashdown '24, Bud teaching organic quantitative analysis, Joe assisting in organic lab, Barney assisting in freshman lab, and I assisting Professor Simpson in qualitative and quantitative analysis.

Bob Heggie '33 is staying on here at Technology as a research associate in vitamins. With him and Bob Woodward '37 both still around, all is none too quiet in Eastman.

There is one announcement to be made to the members of Course V. Mitch Sieminski has finished up the pictures taken for us by Professor Simpson last spring. Copies of size 5" by 8" may be obtained from me at the rate of 25 cents apiece. They came out well and are to be highly recommended.

Course VI. Nick Lefthes has forwarded two letters which he received as secretary for Course VI. The first, from Robert M. Osborn, 2840 West Highland Boulevard, Milwaukee, Wis., states: "In response to your letter, I advise you that I am working for the Allis-Chalmers Manufacturing Company here in Milwaukee. They offer a two-year training course during which the student is sent around to the various shops. At present I am working in the steam turbine test department."

The other letter is from Bob Ritter, who spent the summer in Germany and sent some very good accounts of his experiences in that country. His letter is as follows: "I was fortunate enough to be able to spend two months of the summer in Germany. It was very interesting to compare things as I saw them with what we are accustomed to reading here and also with what I remember from my last visit, six years ago. One of the most impressive features of the mechanism of government under Hitler is the use of pagantry and showmanship. The Germans

as a people love band music, flags, and parades, and they are certainly being treated to plenty of them! I am thinking particularly of the yearly celebration of the Hesse-Nassau division of the Nazi party, held at Frankfurt on the Main. The final day of a brilliant and noisy week featured a giant parade and mass review of 103,000 assorted, uniformed marchers. One of my German cousins secured me an official press card which netted me a fine seat in the grandstand, close to the speakers. It was only this good fortune which kept me there, for all through the long morning as the marchers were coming onto the field, the rain was coming down by the bucket as one thunderstorm after another smashed across the huge sports field. This gave the early arrivals a good opportunity to display a patriotic enthusiasm which even hours of rain and marching couldn't quench. It was noticeable, however, that most of the spontaneous singing from the field came from the units of the Hitler Boys and the Union of German Girls, which were well represented. Many of these kids, under high-school age, had been on the march since before six in the morning — and the review was scheduled for noon, and was late.

"As each unit marched onto the field, it was marshaled to its place by the commands of the field officer from his watchtower above the grandstands, given through an excellently constructed public address system. The officer himself was a good talker and an exceptionally quick-witted man, whose comments and jokes did much to relieve the soggy gloom which occasionally tended to envelope the assembly. Color and interest were provided by squads of motor cycle troops, each carrying a brilliant standard. As the flags gathered under and around the speakers' stand, it became merely a red blur, with the black swastika infinitely repeated. Well, as they always do, the reviewing officers eventually managed to get there and were driven slowly in and out among the ranks, monotonously receiving and returning the Nazi salute. The preliminary speakers were — just speakers. But the great thrill and surprise was provided by Minister of Interior Frick. Quietly and simply he explained the dangerous and impossible situation which had so long existed between Germany and 'our brothers in Austria.' Then, with triumph ringing in his voice, he made the first public announcement of the Treaty of Friendship, which had that morning been signed with Austria. It was as if each and every person present considered it a personal victory, and 100,000 voices shook the ground with inarticulate cheers. The massed bands struck up 'Deutschland, Deutschland, Uber Alles,' and, as if in answer to its cue, the July sun burst through the black clouds and blazed down on a hundred thousand outstretched arms and singing faces. It was a . . . sight . . . vitally indicative of the spirit of New Germany."

This is certainly a fine letter from Bob. I think he should have been an author! — Nick, himself, was around Technology

several times during October still looking for a job. Mike Paskowski and Norton were also still looking.

Course VI-C. Jack Cook, the Technology graduate who went to Harvard, has the following to say about his course: "Two of our boys, Tommy Brown and Louis Adams, are working temporarily with the consulting firm of Jackson and Moreland in Boston. Earle Kinsman spent the summer with the Sprague Specialties Company in North Adams, Mass., in the heart of our beautiful Berkshires, but gave up the job this fall to accept a graduate assistantship at Ohio State (where Professor Johnny Byrne hangs out). He is assistant to the Professor Everitt and is working toward an M.S. Tony Mitropoulos gave up locker-room bridge and went to work in Cambridge for the Simplex Wire and Cable Company. Carl Hedberg has a job in the small tube department of the Bell Laboratories. Our coed, Oh Miss Hannah Moody is doing right well for herself in the cathode ray section of the research and development lab of R. C. A. Radiotron, Harrison, N. J. — After touring Europe with the Thorne-Loomis group, Jack Ayer settled down with the Pennsylvania Railroad in Chicago. He is with the signal division and, after serving three years in various parts of the system as an apprentice, they make him president of the road or something."

Course VII. Ed Pratt writes the following letter from his dormitory over on Longwood Avenue, where he is a student at Harvard Medical School: "I visited M.I.T. last Saturday and obtained the following scanty information from Dr. Horwood '16 and Sam Goldstein '33: Mel First is taking courses at the Institute toward a master's degree in biology and public health. He made a tuberculosis survey of Lynn during the summer. Healey has a good position as an instructor in engineering at a CCC camp. Robbins is studying at Tufts Medical School. Ralph Mankowich is studying at the Boston University Medical School. During the summer, Shapiro was doing voluntary work for the Passaic Health Department, but I don't know what he is doing at present. Miss Shott is now assisting Dr. Williams in his study and research on pathogenic fungi. Stoloff is working for some beverage concern in Cambridge and also taking a few courses towards a higher degree at the Institute. Stolz, at least during the summer, had a job as assistant sanitary engineer in Westchester County. Stan Freedman has turned salesman and is selling soda. I am enjoying the work here, but finding it fully as difficult as any at the Institute. Sorry the information is so sketchy and inadequate, but without replies to letters I can't get much news."

Course VIII. Charlie Evans has moved to 59 Gorsline Street, Rochester, N. Y., from whence he writes: "News from only one more Course VIII man since last month. Carlyle Jacob wrote from Philadelphia where he is now attending school. Apparently school hadn't started when he wrote, and he didn't say anything about his duties there. His address is 1848

North 16th Street, Philadelphia. His room, by the way, overlooks a cemetery — sounds nice and quiet, anyway. Carl was working on his thesis at Technology 'most all summer, and while there he saw several of our classmates. He saw L. P. Cohen, who was on a two weeks' vacation from his job in Fall River. It seems that L. P. is still the big business man — carrying a newspaper with him. . . .

"That's all the outside news. A couple of weeks ago I attended the annual clam-bake of the M.I.T. fellows here in Rochester; the clams and lobsters were shipped directly from Boston and were extremely good. This meeting will probably be written up in some of the other notes, so I won't go into details here."

Course X. A letter from El Koontz was received gladly, not because it contained any news, but because it contained a check for eight dollars, the refund of the deposit which members of the Senior Week Committee were required to make to insure its financial success. It seems that the books of our senior week turned out with only a small deficit when compared with that of some previous classes. El promises a letter within a few days; perhaps we'll have something from him in the next issue.

Vernon Osgood was in town over the week-end of October 24, on his way from the Buffalo Practice School to the Bangor Station. Included in his group are Jimmy Vaughan, Don Kenny, and Henry McGrath. They will be back at Technology about the middle of December to finish their graduate year here. — Ed Everett is back at the Institute as one of the many assistants in the chemistry department. Along with Gus Chandler, he is helping the freshmen make wash bottles and hunt for ions. Over the Columbus Day week-end, Everett did a little hiking. Climbing up Mount Washington by way of the Tuckerman's Ravine Trail, he was contented to ride down in the automobile of a friend whom he met at the top.

Course XIII. A post card from Colón, Panama, explains the absence of news from this Course. Art Wells writes: "Some climate down here. Shirt sleeves all the time and hot at that. Clear in the morning, rain in the afternoon. . . ."

Course XV. The expected news from Bill Garth finally arrived about a week too late to make the last issue. It is given below just as he wrote it; you figure it out: "To start the year off in The Review it is a good idea to take a look and see what all the boys are doing, if any."

"Lars Anderson '35 is working for the Gillette Razor people in Boston. Nate Ayer is with the York Ice Machinery Company in York, Pa. (We hear he is developing a midget ice cube machine in his spare time.) Anthony Belser is with Price, Waterhouse, and Company, checking on the certified public accountants in St. Louis. Dave Blanton is with the Blanton Company in St. Louis. Bill Brockett '35 is in Washington with the Capitol Chemical Company. Joel Bulkley is learning how to become a financial magnate with E. W. Clucas and Company in New York City. Norm Bull

is with the Gulf Oil in Boston. Burns is with C. J. Maney Company, Inc., in Boston. Doug Cairns has been putting up a new beer sign on Kenmore Square for Donnelly Advertising. Bill Canning is married to the former Nancy Shea and is time-and-motion studying with the American Optical Company in Southbridge, Mass. Doug Chalmers is doing a stretch with Alfred Hale Rubber Company in Quincy. (I thought you'd like that. If any of you don't know where Quincy is, write me; I can tell you.)

"Coffin is back at the Institute after Thorne-Loomising. I've heard various rumors as to what Ben Cooperstein is doing. Best sources say he's with the Massachusetts Knitting Mills in Boston, but you can never be sure about Ben. Crumme is having a high old time with General Electric sales in Boston. They sent him to Springfield for a week the first of August, but he hadn't come back by the first of October. Paul Daley '35 works for Barber-Greene in Aurora, Ill. I know they don't sell securities and they probably make gadgets, but that is as specific as I can be. Danforth is specifying stuff for Johns-Manville in Manville, N. J. Rip Devereux is working up to be a financial tycoon with W. E. Burnet and Company right down on old Wall Street. He's gathering the wool of Wall Street and handling shears. (If I keep this up I'm sure Tony will get complaints and perhaps we can have a new correspondent.) Devine is with United Air Lines, Chicago.

"Donnelly is with the boiler makers, Babcock and Wilcox, New York City. John Easton is with the American Can Company. Don't know what plant, but Beer Can Division should reach him. (If you really want him, we'll see what can be done for an address.) Harry Essley is with Reliance Electric in Cleveland. It's a long way from Pennsylvania going in either direction, Harry; what's the solution? Vincent Estabrook is walking the sidewalks of Boston for Jackson and Curtis, if you know what I mean, John Churchill. Last minute advices say that he is indoors now, so don't worry this winter. Dick Fox is here in Boston. When last seen, he was down in the Public Library reading dime novels. He's going with either Buick or New England Coke. Has anybody seen Jack Gardiner?

"Bill Garth is at present very busy, working very hard, overtime, too, trying to get this letter to The Review. . . . That hard work and stuff can go for my job, too, just in case any of the earlier graduates read this column. Gomberg is with the Gomberg Petroleum Sales, Inc., Boston. Herb Goodwin is still one of the boys and can be found at the Deke House. Is Gus Gorham with Gardiner? Graves is with the Ingersoll Milling Machine Company, Rockford, Ill. Bob Hannam is with Edison Electric Illuminating Company of Boston. Harry Hazelton is in St. Louis with the Lambert Pharmacal Company. . . . Hinton is accountant *par excellence* with Arthur Anderson Company, New York City. — ANTON E. HITTL, *General Secretary*, Graduate House, M.I.T., Cambridge, Mass.

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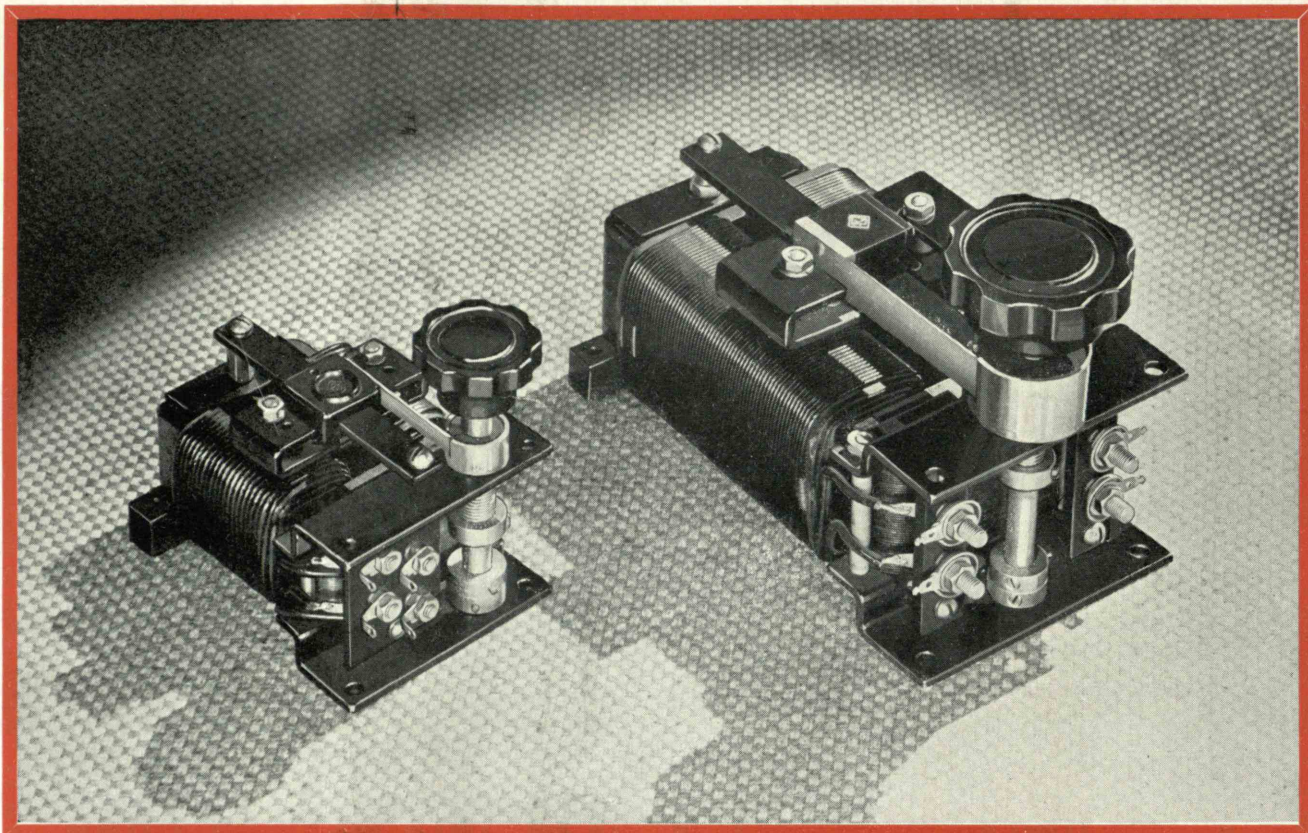
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